The Internet may be unpredictable, but that's not scaring away business. News, page 14

Salaries for scarce AS/400 programmers soar, but IS students hardly know the system exists. Corporate Strategies, page 37

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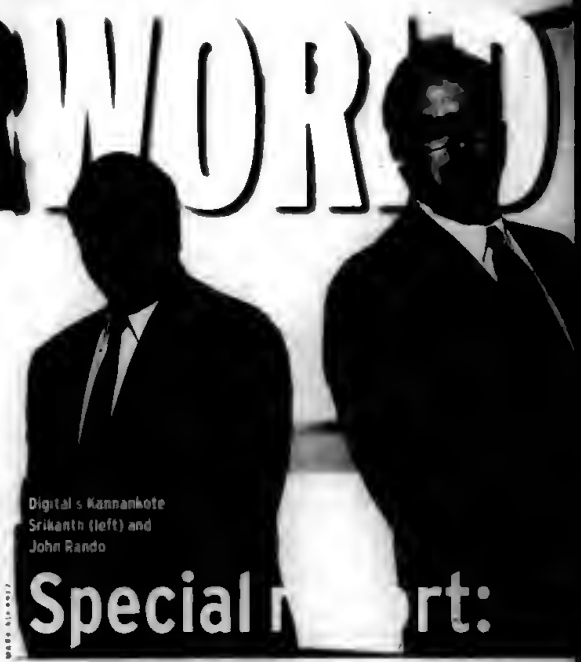

Digital's Kannankote Srikanth (left) and John Rando

Special report:

Microsoft declares war

▸ *Stuns Sun with refusal to ship Java class libraries*

By Carol Sliwa and Sharon Gaudin

MICROSOFT CORP. last week formally declared war on Sun and its Java Foundation Class Libraries, making clear its intention to block efforts to make Java an industrywide, cross-platform development language.

"[Sun Microsystems, Inc.] is trying to turn the JFCs into the Sun operating system," said Steve Ballmer, Microsoft's executive vice president of sales and support. "It's sort of the next chance for Sun to be a desktop operating system player. The first one was Unix, and that was a strikeout. Now they are trying again with JFC, and we hope they don't win."

The crux of Microsoft's battle plan is its rejection of the JFCs, which it sees as the real threat to

Microsoft, page 17

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PEOPLE WHO NEED PEOPLESOFT
Client/server software skills are in high demand. Next page

ROGUE E-MAIL ACCOUNTS
IS frets as users sign up for unauthorized free 'net mail. Page 4

NT, yes; NC, no
Gates sees NT on every corporate desktop. Exclusive interview. Page 6

FLORIDA DUNKS 'NET SURFERS
State welfare agency fires two workers for Internet activity. Page 10

American Eagle to save $4.5M by rebuilding desktops with NCs

By April Jacobs

LOOKING TO SAVE $4.5 million and avoid laborious alterations at its ticket counters, a regional commuter airline, American Eagle, plans to replace aging terminals and PCs with network computers for about 3,000 users.

And although the Fort Worth, Texas, subsidiary of American Airlines is bucking a corporate standard of diskless workstations and PCs, it may be one of the first in a much longer line to adopt network computers, analysts said. They listed airlines, insurance companies and other customer service-centered businesses as prime candidates for network computers.

American Eagle, page 98

Insurer 'lies' to avoid year 2000 costs

By Tim Ouellette

ADRIAN BROWN used a little white lie to solve his year 2000 problem. He tricked his mainframe into thinking it was 1969.

And he estimates the move saved his small insurance company more than $3 million in conversion costs.

The problem: Brown expected his vendor to request close to $4 million to prepare Montgomery Mutual Insurance Co.'s lone packaged mainframe policy management application for the year 2000.

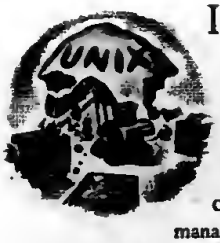
Insurer, page 16

INTEGRATION GRATIFICATION

Digital No. 1? Unisys No. 2? No, we aren't talking about midrange market share, circa 1985. Those venerable hardware vendors topped *Computerworld*'s customer satisfaction survey of systems integrators. Why? As hardware profits dwindled, Digital and Unisys poured resources into the systems integration business as a survival strategy.

Now IS professionals give them slightly higher marks than pure integrators such as Electronic Data Systems and Andersen Consulting, especially in the areas of technical savvy, project management skills and business practices.

Special report follows page 50



It might be **five years** before **Windows NT** is in the same league as **Unix.** Seven analysts and 201 IS managers share their thoughts about **NT vs. Unix.** The bottom line: NT has chipped away at the cost of ownership and ease of management, but otherwise it's a Unix world. **Buyer's Guide**, page 69

Part of the challenge: a shortage of IS people who have NT skills. **IT Careers**, page 79

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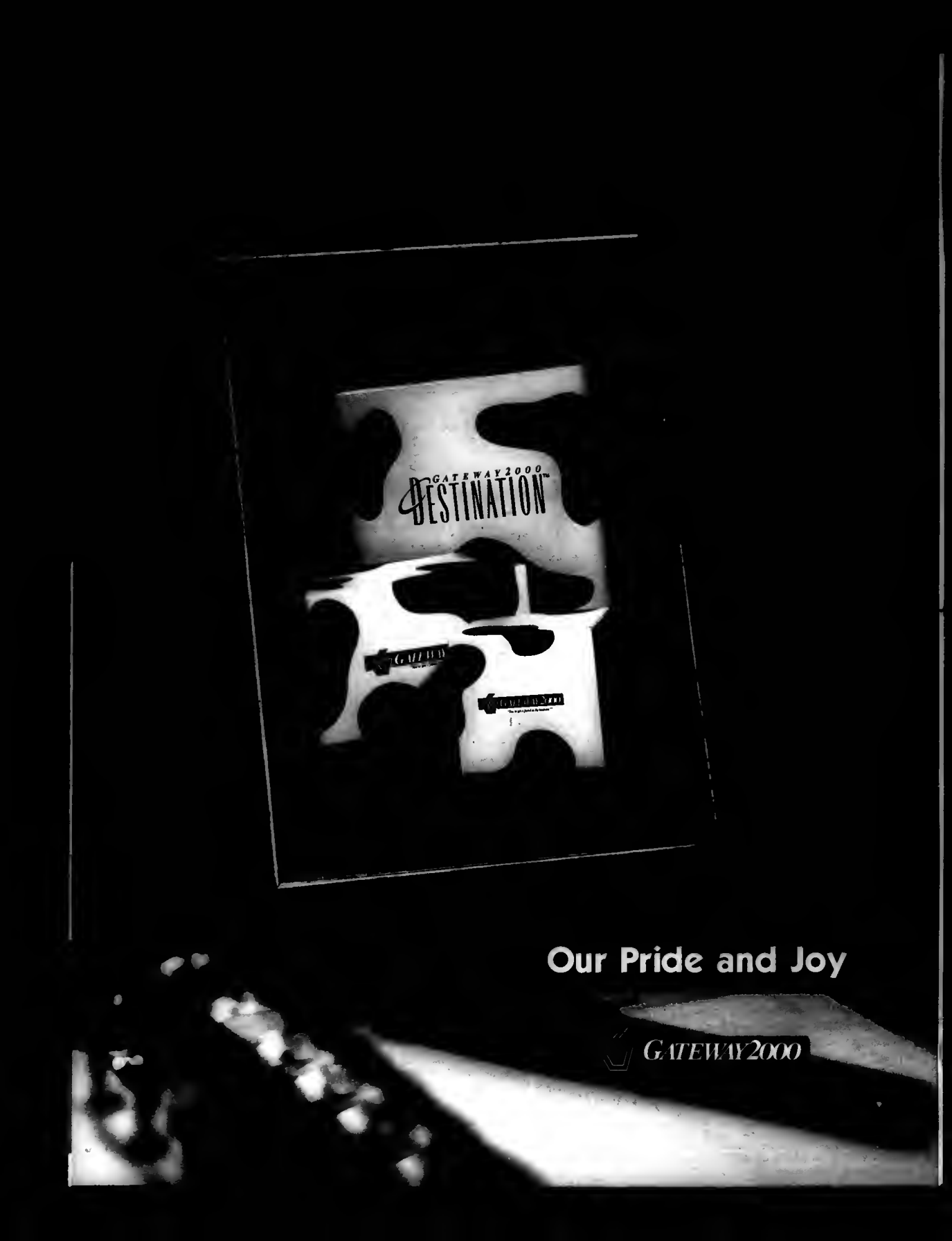
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NEWS

4 ... in the outsourcing ...

... multibillion-purchase of ... accelerate scalable ... technology.

6 ... athletic on a pro-Basque Web site spark fears that other political sites may be vulnerable.

8 ... Fargo runs into systems integration problems in its merger with First Interstate Bank.

9 ... claims big cost-of-ownership gains when Windows NT 5.0 ships next year.

12 ... named as new CEO ... he doesn't expect to tinker with ... plans.

... messages, concerned about ... year 2000 fixes, build defenses ... potential lawsuits.

... battered by the foray into local ... service, faces another management shuffle.

... 1996

... David Gassney's modest proposal: ... World as the language of the 'net.

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... STRATEGIES

... Marquette College maps resume-tracking software to link graduates to jobs.

... An Australian bank's experience illustrates the spread of outsourcing.

... tries to jump-start AS/400 training on campus to meet skills need.

THE INTERNET

... Wall Street look-drives a protocol for secure Internet transactions.

... Computerworld July 28, 1997 (www.computerworld.com)

Oracle, PeopleSoft skills in high demand

By Randy Weston

ARE YOU KICKING yourself for missing the big-bucks market for SAP R/3 skills because you focused on other enterprise applications packages?

Don't fret. Recruiters across the country are scrambling for people who have worked with the client/server applications from SAP AG's competitors, namely PeopleSoft, Inc. and Oracle Corp.

"The demand right now for people is very high. The supply is very low," said Becki Tschirpke, a director at PeopleIndex LLP, a Denver-based placement company that specializes in the PeopleSoft market.

Such a seller's market means those with skills in PeopleSoft products can command salaries of up to $135,000 per year as a consultant and $50,000 to $80,000 per year for a staff position.

Oracle professionals can earn $144,000 per year or more as consultants and $80,000 to $105,000 per year for staff placement, recruiters said.

SPOILS OF INDEPENDENCE

Independent Oracle consultant Debbie Childs decided 18 months ago to test the market demand for her skills in Oracle configuration and business processes. She took her talents on the road after working on an Oracle implementation at Schlage Lock Co. in San Francisco. Since leaving Schlage, she has landed five large contracts and five smaller ones.

But the move wasn't only for the money, which she admits is much better as an independent contractor than as a permanent employee.

"I love it: It gives me flexibility," Childs said. "Personally, I'm not willing to travel five days a week. That's why I'm an independent contractor. If I was willing to travel, I'd be working for a consulting firm."

Childs acknowledged that she and other consultants are part of the reason companies have to pay higher salaries for permanent staff.

"Companies want to hire people in-house to do the implementation and then support the product," she said. "The problem is people are getting the skills, seeing opportunities to consult and leaving."

The demand for R/3 consultants was driven by big businesses that are now wrapping up client/server projects or finished with them. The next wave of client/server projects is happening at midsize firms that are demanding PeopleSoft and Oracle consultants, analysts said.

Those midsize companies generally have smaller IS staffs and fewer resources to dedicate to such a migration project, so they are looking for help.

Violet O'Brien, a vice president at Torch System Advisors, Inc. in Houston, said another reason for the skills shortage is that consulting firms, including hers, aren't doing enough to cultivate talent by training people in Oracle or PeopleSoft skills.

"We have to bring people in that we can train. There has to be new growth," she said. "The problem is ... thousands of recruiters across the country are picking over the same people." □

Top skills in demand for PeopleSoft implementations:

- PeopleTools, PeopleSoft's proprietary development tools
- Oracle, Informix and DB2 databases, especially native SQL skills
- SQR, the technical procedural language PeopleSoft uses for report writing and developing interfaces
- Manufacturing modules, PeopleSoft's flagship application

Top resources in demand at Oracle sites:

- Database administration
- Oracle applications and people who can solve business problems using them
- Business analysts

Fleer's Eric Garrison used collaborative tools to design an online product database. The Internet, page 41

Health care and manufacturing firms and utilities find the future in intranets. Supplement follows page 32

Late-night programmers can get their extra dose of caffeine from Tasty Buzz Taffy. Alt.cw, page 100

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- Business analysts

Rebirth

Not long ago, the concept of hardware vendor systems integration was an oxymoron. The only systems the longtime computer makers would integrate were their own often-incompatible legacy lines.

What a difference a few years make. As the proprietary hardware market crumbled, systems vendors looked for salvation as providers of multivendor integration services. As far as customers are concerned, they're doing a pretty good job.

Our giant user satisfaction study of systems integration vendors (following page 50) finds that four of the five top-rated vendors are traditional hardware suppliers. All the integrators did fairly well, but users rated Digital, Unisys, IBM and HP among the most responsive companies.

I think the reasons have a lot to do with a turnaround in thinking at those companies. Hardware makers long regarded integration services as a tool to leverage sales of more hardware. But confronted with the noose of a disappearing hardware market, they have refocused on using those long-term customer relationships to generate services business. The rationale: Happy service customers will stay customers longer and may even buy some new hardware in the bargain.

Happy service customers will stay customers longer.

Traditional hardware vendors also have done the following:

- Refocused on vertical markets, in which their experience gives them an edge in addressing industry-specific issues.
- Applied their expertise with government and big commercial contracts to packaging services for all sizes of customers.
- Redeployed skilled but sometimes redundant employees into a ravenous labor market.

As you read this week's special report, you'll repeatedly see the top integrators talk about doing whatever it takes to win a contract, maintaining long-term relationships and delighting the customer. Sounds like a pretty good formula to me.

Paul Gillin, *Editor*
Internet: *paul_gillin@cw.com*

THE FIFTH WAVE
BY RICH TENNANT

"I found these two in the multimedia lab morphing faculty members into farm animals."

E-mail Rich Tennant at thewave@tiac.net

Users petition HP

▸ *OpenView Forum seeks commitment*

By Patrick Dryden

OpenView Forum, an independent user group, sent these requests to HP

- Don't endorse competing management software
- Every division should support OpenView as HP's strategic direction
- Explain why the hardware division promoted CA's Unicenter TNG instead of HP's OpenView

DEAR HP Please get your act together.

That was the plea sent to Hewlett-Packard Co. last week by leaders of the OpenView Forum, the user group that represents about 700 organizations that rely on HP's OpenView tools to manage their networks and systems.

For the past two weeks, shocked OpenView users have wondered why HP would endorse competing management software from Computer Associates International, Inc. HP's hardware division will ship CA's Unicenter TNG, as well as OpeoView, with both HP-UX and Windows NT systems. It will also support Unicenter TNG.

And users have been called on the carpet by their managers, who fear that HP's software division is abandoning efforts to make OpenView a serious contender for enterprisewide management.

Despite HP's immediate spin control, "the damage has been done," said Sandra Potter, president of the OpenView Forum and a telecommunications engineer at Air Products and Chemicals, Inc. in Allentown, Pa.

"We've chosen OpenView as the best platform for our shops, but now we must rejustify it to management and investment groups," Potter said.

BACKSLIDING

In the past year, Palo Alto, Calif.-based HP has made "major strides" in proving OpenView can manage systems, applications, LANs and much more than networks, "but this mixed message casts a lot of doubt on that progress," said Paul Edmunds, senior network analyst at Duke Energy Co. in Charlotte, N.C.

Support for both OpenView and Unicenter TNG as enterprise managers "sends a confusing message in the least," said Robert Mobley, supervisor of network design and management systems at Chevron Information Technology Co. in San Ramon, Calif. "This makes it more difficult for me to see clearly where HP is going."

In a letter to HP Chairman Lew Platt, the OpenView Forum requested an end to endorsements of competing products and better cohesion among divisions, "because HP is one company from a customer perspective," Potter said.

HP's hardware division wants to offer buyers of its HP 9000s or NetServers a choice of management software. Yet HP's tools and support division wants to make OpenView a strong enterprise manager on par with CA's Unicenter TNG and TME 10 from Tivoli Systems, Inc.

"Our structure causes problems like this," conceded Andy Vanagunas, an OpenView program director. "We owe it to the users to clarify our commitment."

"They threw a wrench in the works."
– Sandra Potter, OpenView Forum

HP better hurry, analysts said.

"They stumbled, sending out mixed messages. But in reality, HP is more committed to OpenView than it ever has been," said Herb VanHook, management program director at Meta Group, Inc. in Westport, Conn.

Evidence includes HP's push for systems management through IT/Operations combined with Network Node Manager, recent acquisitions and growing support for managing applications.

By endorsing a rival, HP appears neutral, said Paul Mason, director of the enterprise systems management program at International Data Corp. in Framingham, Mass.. As a result, OpenView could become just a subset of the two most popular frameworks, Unicenter TNG and TME 10, he said. □

New FCC chief to be nominated

By Matt Hamblen

PRESIDENT CLINTON plans to nominate U.S. Federal Communications Commission General Counsel William E. Kennard as the next chairman of the agency, FCC officials said last week. He would be the first African-American to head the commission.

Kennard, 42, has served as lead counsel for three years and improved the agency's winning record in the U.S. Court of Appeals.

He would replace Reed Hundt, who recently announced his resignation. Hundt will remain as chairman until the Senate confirms a successor.

Clinton's nomination of Kennard isn't yet official, although the White House informed the FCC of Clinton's intentions on Thursday, said Maureen Peratino, deputy director of public affairs at the FCC. □

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- CHECK OUT Computerworld Editor Paul Gillin's chat with Microsoft Chairman Bill Gates about the Windows 98 and NT 5.0 upgrades, NT's incursions onto corporate desktops and his philanthropic efforts. *(www.computerworld.com)*
- SOME WOMEN in IS are moving up the corporate ladder, thanks to formal mentoring programs. What does mentoring have to offer you? Discuss this issue with Computerworld senior editor Laura DiDio in an online forum. *(www.computerworld.com)*

Carriers eye corporate LAN outsourcing

▸ *Move can refocus staffers on strategic projects*

By Bob Wallace

SPRINT CORP.'s decision last week to spend $425 million for a LAN integration firm is the latest move by various carriers to capture the LAN outsourcing business of large corporate users.

Many user firms continually face a skills shortage

Some users and analysts said the idea of a carrier taking over users' LANs has merit, because outsourcers have large staffs of talented engineers whom user firms may have trouble hiring.

Another benefit is the ability to free LAN staffers from routine chores and then refocus them on proactive network management or strategic business projects.

Analysts said the downside is that some carriers don't know much about internetworking, so users have to carefully choose the right outsourcers.

"Do you let them handle limited internetworking gear such as routers and hubs, or do you go beyond that and let them have mission-critical servers?" asked Brad Albers, senior manager of information services at Home Depot, Inc. in Atlanta.

Albers said LAN outsourcing is appealing because the big carriers have top-flight talent and many user firms continually face a shortage of skilled staff.

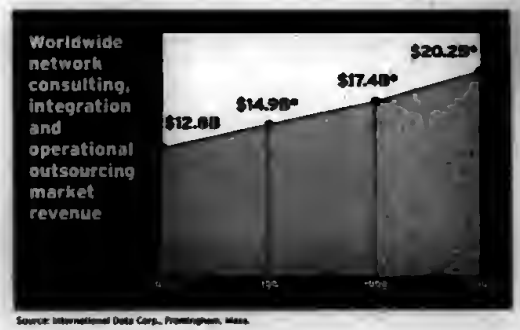
In the past year, local and long-distance carriers — which typically handle wide-area networks (WAN) for users — have reached deeper into the enterprise network to expand profits.

BIG PLAYERS

AT&T Corp. recently rolled its LAN services into its outsourcing unit, and MCI Communications Corp. spent billions last year to acquire outsourcer SHL Systemhouse, Inc. Local carriers Bell Atlantic Corp., US West, Inc. and Pacific Bell have also created network integration units. And Sprint plans to buy Houston-based Paranet, Inc.

The worldwide LAN/WAN outsourcing market is expected to more than double to $27.7 billion by 2001, according to researchers at International Data Corp. (IDC) in Framingham, Mass.

"Users will find LAN [outsourcing] appealing because they can put the people they had running the LANs on more important projects, such as monitoring servers," said Traci Bair, an analyst at IDC.



Source: International Data Corp., Framingham, Mass.

LAN outsourcing also can reduce salary strains.

"Outsourcing our LAN operations took a huge load off salaries around here," said Trey Layton, a network systems engineer at Eastman Kodak Co. in Rochester, N.Y.

But some users said they are wary of turning their LAN operations over to carriers.

"The most important thing ... is check the references and track record of the companies you're considering," said Maralyn Rosenblatt, vice president of desktop technologies at Countrywide Home Loans, Inc. in Simi Valley, Calif. "Some of these companies are so new at it, they have few, if any, references to check."

When evaluating LAN outsourcers, analysts said users should make sure the contractor understands their day-to-day LAN operations and problems. And if users find a match, they should outsource in small chunks of nonessential operations at first, said Skip MacAskill, an analyst at Gartner Group, Inc. in Stamford, Conn.

Users also should attach service-level agreements with stiff penalties to a LAN outsourcing contract, so there is recourse if performance slips below certain levels, he said. □

& **Australian bank shows outsourcing's reach. Page 37**

& **Sprint PCS strikes deal to boost wireless users' roaming abilities. Page 45**

Sun, The Registry strike staffing deal

By Julia King

SUN MICROSYSTEMS, Inc. and The Registry, Inc., an information systems staffing firm in Newton, Mass., have cut a unique outsourcing deal that aims to get certified Sun systems engineers in the field more quickly.

Analysts said the agreement was a win-win situation for both companies. They also foresee more partnerships between technology vendors and recruitment-savvy staffing firms as high-tech companies continue to strain under the current technical labor shortage.

More than 95,000 IS jobs at high-tech companies remain vacant due to a shortage of technical talent, according to the Information Technology Association of America in Washington.

"Recruiting and retaining high-quality [information technology] talent is a major issue for the industry," said Denny Wayson, an analyst at Dataquest in Westboro, Mass. Under the agreement, Sun leverages The Registry's strengths in both of those areas, he said.

"The demand for technical resources is becoming more and more competitive," said Ladd Willis, executive vice president at First Manhattan Consulting Group in New York. "If a company has developed a database and the expertise to be more effective at recruiting, it makes sense to turn that into a business," he said.

Under a pilot program that begins next month in New England, The Registry will recruit professionals to put through Sun's certification training, then deploy the new consultants to several hundred Sun resellers on an as-needed basis. Sun will pay for and conduct the training, which typically lasts about two weeks and includes classroom and laboratory work.

The program with Sun represents "a tremendous tool to use to attract even more new talent," who would receive the Sun training free of charge, said James McKee, a vice president at The Registry in San Francisco.

McKee said The Registry would be open to similar agreements with other vendors, but Sun has been the "most proactive" in negotiating an outsourcing agreement with the firm.

The Registry employs about 3,200 contract professionals and is growing fast. Since an initial public offering in July 1996, the company has acquired seven other staffing and consulting firms. This week, it will complete its purchase of Renaissance Solutions, Inc. in Lincoln, Mass. Annual revenue for the combined enterprise will be about $350 million. □

Internet free-mail creeps in on E-mail

▶ *Viruses, security risks among key IS concerns*

By Barb Cole-Gomolski

"THE E-MAIL system in my office lacked speed. When I complained to a colleague, he recommended RocketMail, since it was quick and efficient. I use it mostly for personal mail, but when I need to get E-mail to a client in a hurry, I use RocketMail."

That customer testimonial, published on the World Wide Web site of Four11 Corp., maker of RocketMail, demonstrates the allure of a new breed of free Internet electronic-mail services that have been winning over corporate users.

And that's making information systems managers nervous.

Fast and easy to use, Internet E-mail accounts primarily are used at home or on the road. And they are free; the only catch is that users have to put up with banner-style electronic advertising.

But IS sees several problems associated with these rogue E-mail accounts.

"We would view this as doing personal business on the company's intranet, and that is generally frowned upon," said Dennis Murray, head of corporate technologies at Novartis Pharmaceuticals Corp. in East Hanover, N.J.

Worse yet, if workers use these accounts for company business, sensitive data may traverse the public Internet, and the company's server-based virus-scanning software might be bypassed, he said.

NO SUPPORT

Several messaging managers said they would try to discourage workers from signing up for these accounts. If for no other reason, administrators don't want another mail system to manage.

"They can go ahead and use it, but we won't support it," said Bob Syren, a programmer analyst at the University of Miami in Coral Gables, Fla.

ANDRZEJ KOZLOWSKI

It could become increasingly difficult to keep these Internet E-mail services out, however.

Four11 in Menlo Park, Calif., has integrated its RocketMail service with its popular Internet white pages directory. And WhoWhere in Mountain View, Calif., last week announced a deal to include its Web-based E-mail service with the popular Internet search engine from Excite, Inc. in Redwood City, Calif.

As a result, these services will be available with a few mouse clicks to any user with a Web browser.

"Can you imagine how much spamming goes on there?" said a mail administrator at a large financial services firm in New York. "This would just be another E-mail address where junk E-mail would be sent," he said.

Research firms contacted by *Computerworld* said they aren't tracking the usage of these free E-mail services. But USA.Net in Colorado Springs said it has signed up 1 million subscribers since it launched its NetAddress free E-mail service in December. WhoWhere hopes to sign up 10 million subscribers by year's end, said Dale Fuller, the company's president and CEO.

Fuller said about 80% of the 100,000 users that beta-tested WhoWhere's E-mail service are corporate users. "Most were using it as a secondary E-mail system to check their mail from the road or while at home," he said.

He acknowledged that he was surprised by the response from corporate workers. "We originally thought this would be a consumer product," Fuller said.

But don't look for free E-mail to replace traditional mail clients. Most companies want secure services, and they aren't willing to put up with advertising, said Nina Burns, president of Creative Networks, Inc., a research firm in Palo Alto, Calif. □

Boeing purchase gives NUMA new lease on life

By Jaikumar Vijayan

WHEN The Boeing Co. recently sealed a deal to purchase servers from Sequent Computer Systems, Inc., it did more than just sign a check for $59 million.

The Seattle-based aerospace company's decision marks the largest and most high-profile endorsement yet of an arcane technology called Non-Uniform Memory Access (NUMA).

Boeing's endorsement could give NUMA a much-needed boost as it vies for legitimacy as a relatively inexpensive alternative to low-end mainframe and enterprise server technologies.

NUMA's promise lies in its ability to let users scale applications far beyond the limits imposed by current symmetrical multiprocessing (SMP) technologies. For example, although most SMP servers may run into price and performance issues beyond 16 processors, NUMA servers can scale up to 32.

That kind of scalability is crucial for running large database and online transaction processing applications.

Boeing is using Sequent's NUMA servers in a massive multiyear process redesign project that will eventually move core applications from mainframes to a client/server environment. Part of the project involves moving data from multiple sources and manufacturing locations into a large database that will eventually sit on Sequeot NUMA servers, said Scott Griffin, a director of technology at Boeing.

So far, the systems, which are still in testing, have lived up to "throughput, performance and reliability expectations" for the project, Griffin said.

The Boeing win "really validates NUMA as a commercially viable technology in a lot of people's minds," said Scott Andersen, director of technology at Computer Sciences Corp., the lead systems integrator for Hyatt Hotel & Resorts in Oak Brook Terrace, Ill.

"There has been a lot of speculation about whether NUMA will take as long as SMP to mature. The answer is, it's going to be a lot faster," Andersen said.

Millipore Corp. in Bedford, Mass., recently upgraded from a Sequent Symmetry server to a 16-processor NUMA box to run its Oracle Corp.-based financial and manufacturing applications.

Boeing's Scott Griffin: NUMA has lived up to expectations

"From our perspective, NUMA came online just in time," said Ron Hawkins, Millipore's director of technology. He said $150 million in new business late last year meant "increased transaction loads and an urgent need for increased hardware capacity."

Hyatt, which uses a massive 22-processor Symmetry SMP server from Sequent, this week will take delivery of a NUMA server that will eventually run Hyatt's reservation system.

"[Boeing] is an important win for NUMA," said Jonathan Eunice, president of Illumnata, Inc., a consultancy in Nashua, N.H. "But it is more important that these sort of wins start happening across the industry and for other vendors, too," in order for NUMA to gain widespread momentum, he said.

More systems will mean more choice and better application support on NUMA platforms for users.

Only a handful of vendors are shipping NUMA systems. They include Sequent, Silicon Graphics, Inc. and Data General Corp. Waiting in the wings are vendors such as Sun Microsystems, Inc. and Hewlett-Packard Co.

Most of the vendors are building NUMA servers with commodity chips and components, such as Intel Corp. processors and motherboards, which make them relatively inexpensive. Sequent's NUMA servers typically cost $500,000 to $1 million, about the same as most large, but less scalable, Unix SMP servers. □

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Gates: Windows NT will dominate by 2000

Microsoft Corp. Chairman Bill Gates last week sat down with Computerworld Editor Paul Gillin to discuss the impending upgrades to Windows 95 and NT, cost of ownership issues, and Microsoft's competitors.

CW: You've got two major desktop upgrades shipping close together next year. What should corporate customers buy?

GATES: With the price of memory coming down and most new machine purchases with 32M bytes of memory, we're expecting to see a fair shift toward NT 5. It's the biggest release of NT since it was introduced. It's got two big initiatives: the directory, which is the key to security, and the Zero Administration stuff, which is at the top of most customers' list of concerns right now.

CW: What are you going to do to take the Zero Administration initiative beyond buzzword to something tangible?

GATES: We've put out the Zero Administration Kit, which lets you decide centrally what applications you want on a workstation and control how you distribute and update them. NT 5 is the breakthrough. The ability to have all [the information about a workstation's files and configuration] viewed, controlled and updated centrally is a very big advance. It gives you the ability to immediately plug in a machine [running 32-bit Windows] or use another machine on the network [as if it were your own]. We think this is the first time anybody has said you can have central backup and still be portable. As soon as you come back with your portable, we replicate your documents to the server, so if you go to somebody else's machine, the documents are there.

CW: By 2000, what would you like to see as the percentage of corporate desktops running NT vs. Windows 9x vs. Windows 3.1?

GATES: I think by the year 2000, there's no doubt all the machines going [into corporations] will be NT, and you'll have had several years of that. You'd be close to the majority being NT-based.

CW: How has the network computer concept changed Microsoft?

GATES: The network computer pitch is basically to throw out all the PC applications in order to get central administration. The NC is such a step backward that you have to wonder why people can even contemplate it. [The fact that they do] brings home how concerned they are about manageability. People have a lot invested in their applications. We have to give them the best of what the PC is, along with that central administration.

CW: You don't make any money from disks. So why is it so important whether there is a local disk involved?

GATES: We supported diskless PCs 10 years ago. Nobody bought them because people like responsiveness.

In NT 5, we boot the operating system remotely. You could page across the network, but there's no technology today that makes paging across a network usable. I think we'll continue to use disks in the vast majority of machines.

CW: In the database market, do Informix Corp.'s and Sybase, Inc.'s problems present a chance for you to gain market share? What stands in the way?

GATES: Oracle! But sales of [Microsoft] SQL Server are going up very rapidly, benefitting from the growth of NT. The transaction levels that NT and SQL Server can do are well beyond what most companies need.

CW: Would you consider buying a database company to get more credibility in the high end?

GATES: No. We've got a path we're very excited about.

CW: Do the problems at Apple create any potential legal problems for you in terms of operating system market share?

GATES: There's no shortage of competition in operating systems. Today's operating systems will be obsolete in five years. Sun, IBM and others will tell you that five years from now, they'll be in the position we are in today. □

E-mail bombings shut down site

By Sharon Machlis

A POLITICALLY motivated wave of hacking attacks has shut down a World Wide Web site, sparking fears that other sites with controversial content may be vulnerable to similar tactics.

The Institute for Global Communications (IGC) in San Francisco earlier this month was hit with hundreds of electronic-mail bombs and other denial-of-service attacks because it hosted a site that promoted Basque independence.

The Web attack likely came from Spaniards upset that the Web site had information about Euskadi Ta Askatasuma (ETA), a Basque separatist group that has carried out a campaign of assassinations and bombings for many years. The recent ETA murder of a 29-year-old town official triggered large-scale Spanish protests against the ETA.

Th IGC received many legitimate complaints about the Basque site, but also faced "organized, malicious attacks designed not to communicate with anyone, but simply to make its computers unusable," according to a statement released by the Internet service provider.

The IGC said it reluctantly suspended the controversial site so the 13,000 IGC subscribers wouldn't lose their Internet access.

"It is not just governments that can censor political speech," said Audrie Krause, executive director at NetAction, an Internet consumer activist group in San Francisco.

"The vigilante attack on IGC may actually be a bigger problem than censorship by governments, because [Internet service providers] have no recourse for a vigilante attack," Krause said.

Most corporate webmasters don't expect political attacks, but some are concerned about potential hacker responses to the content on their sites. "We certainly worry about that quite a bit," said Vicki Zilaitis, director of technology at Time, Inc. New Media in New York.

NOT SKIRTING CONTROVERSY

The company's Netly News site can feature "some pretty controversial things, but editorially we think those things are important," Zilaitis said.

Webmasters can try to prepare for attacks if they know something hot is going up on their site. When Netly News demonstrated a security lapse by stealing someone else's Internet domain, for example, "we needed to take some precautions so our domains couldn't be stolen," she said.

The fate of the Basque Web site "concerns me, especially since IGC is our Web host," said John Magge, Web site director at Planned Parenthood Federation of America in San Francisco.

Despite fierce opposition to some of the organization's work, "we have not had any kind of incident like this," Magge said.

Experts advise increasing security, but they acknowledge that nothing on the Internet is hacker-proof. "We take every precaution we can," Zilaitis said. "Some of it is within your control, and some of it isn't." □

Protection isn't perfect

Experts say it's difficult to protect systems from the kinds of attacks that recently hit the IGC.

Besides the E-mail bombing campaign of hundreds of duplicate messages, the IGC reported numerous huge files aimed at taking up server space. "This destructive campaign has overwhelmed our ability to keep our system running," according to an IGC statement. Administrators sometimes limit the amount and size of incoming messages to try to thwart E-mail bombs, said Mike Zboray, an analyst at Gartner Group, Inc. in Stamford, Conn. Mail will still pile up, but at least the server usually stays up, he said.

Denial-of-service attacks such as "syn flooding," which repeatedly seeks large numbers of Internet synchronization connections, are tough to trace if hackers have taken steps to cover their tracks, Zboray said.

Some software packages — such as WebStalker from Haystack Labs, Inc. in Austin, Texas, and RealSecure from Internet Security Systems, Inc. in Atlanta — will monitor a network for syn flooding attempts and break persistent connection requests. But some legitimate user connects also could get spiked, Zboray said.

— Sharon Machlis

Correction

Because of incorrect information from the vendor and reporting errors, the July 14 story "Cashing in on year 2000" contained inaccuracies about the 2000 Secure insurance policy offered by J&H Marsh & McClennan. In some cases, the policy will cover embedded microprocessors. It will cover failures in computer systems at a supplier or customer if the third party undergoes an audit or provides evidence of year 2000 compliance. If the insured can't pass audits of the third party year 2000 work, the insurer could raise the price of the coverage or limit it.

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Merger glitches hit bank's bottom line

▶ *Downsizing leaves few with back-office smarts*

By Thomas Hoffman

WELLS FARGO & CO.'S renowned stagecoach has hit a pothole in its ambitious merger with First Interstate Bank.

On July 15, the nation's ninth-largest bank stunned Wall Street analysts when it announced a $150 million write-off to cover lost or misplaced deposits, which led to a 37% drop in earnings for its second-quarter financial results. Wells Fargo executives described the deposit debacle as a paper-based problem because the bank had trouble reconciling First Interstate customer account numbers with its own.

However, analysts said those problems were exacerbated by differences between Wells Fargo's general-ledger systems and those used to support First Interstate's 10-state network. Under its aggressive merger plans, Wells Fargo tried to consolidate systems that supported 975 First Interstate branches with its own within eight months. But Wells Fargo failed to bring its general-ledger systems together fast enough to identify and reconcile the First Interstate deposits lost in the shuffle.

Trying to meld these disparate systems together so quickly "is like putting two bowls of spaghetti together — it's tough to separate one from another," said Bill Burnham, a senior analyst for electronic commerce at Piper Jaffray, Inc. in Minneapolis.

Wells Fargo has since rectified the problem, in part by locating some missing accounts and by reimbursing those customers whose deposits were misplaced. In a recent conference call to reporters, Wells Fargo Chief Financial Officer Rodney Jacobs said the bank has resolved its "remaining integration issues."

Many observers said that in this project and other technological bungles during the merger, Wells Fargo was hamstrung by having lost so many of First Interstate's information systems and back-office employees to attrition and downsizing. Sixteen of Interstate's top 18 technology executives jumped at Wells Fargo's attractive buy-out offer, which ran as high as two years' salary regardless of time served.

LACK OF KNOWLEDGE

Combined with the downsizing of First Interstate's back office, Wells Fargo found it was lacking First Interstate managers with intimate knowledge of its back-office environment. Wells Fargo has worked through those issues, albeit with a smaller, less knowledgeable staff than it would have hoped for.

"I suspect that [Wells Fargo] let so many people go that the effort to reconcile items [checks and deposit slips, for example] just became impossible," said Bob Landry, a technology analyst at The Tower Group, a Newton, Mass.-based financial services and technology consultancy.

There have been other systems snafus along the way, including a data-entry problem last year that resulted in $40 million in deposit delays for thousands of employees at the University of California [CW, Sept. 30, 1996]. That was followed by a capacity problem with 3Com Corp. router software, which slowed Wells Fargo's IBM SNA network to a crawl. That led the bank to miss one of its Fedwire payments. Fedwire is a high-speed computerized network that allows commercial banks to transfer balances for its business customers to the Federal Reserve System. A 3Com spokeswoman later attributed the glitch to the massive influx of new First Interstate accounts onto the network.

Wells Fargo executives have been candid about the company's mishaps. "We had too much confidence in ourselves as miracle workers, and we didn't do it this time," said Jacobs, referring to the completion of the First Interstate merger. In 1986, Wells Fargo acquired Crocker National Corp. in what many analysts term a model banking merger.

Trying to meld disparate systems together so quickly "is like putting two bowls of spaghetti together – it's tough to separate one from another."

– Bill Burnham, Piper Jaffray

One analyst said Wells Fargo, an industry leader in electronic banking, has put its systems integration woes behind it. Wells Fargo "has been running cleanly for the past couple of months," said Ronald I. Mandle, a banking analyst at Sanford C. Bernstein & Co. in New York. "Check processing is Banking 101. This is a problem that can be solved." □

SHORTS

AOL kills phone number plan

America Online, Inc. has scrapped plans to give subscribers' telephone numbers to the company's advertisers. In an online letter to subscribers, Chairman and CEO Steve Case said the Dulles, Va.-based company was going to give phone numbers to some advertisers for telemarketing campaigns this fall. The company wasn't going to rent the phone numbers or subscribers' electronic-mail addresses to telemarketers, Case said. AOL reserves the right to call its more than 8 million subscribers to offer products, Case said.

Smaller help desks are better

Hiring plenty of staff for a company's internal help desk doesn't necessarily translate into better service. That's the finding of an international survey by **Xephon Ltd.** in Newbury, England. The survey found smaller help desks manage staff and service more closely. Set service agreements between users and support staff also boost user satisfaction levels, according to the poll of 246 organizations in North America and Europe. Those with highly satisfied users had an average of 183 desktops per help desk worker. Those with low satisfaction levels had an average of 89 desktops per worker.

Microsoft to offer free browser

Microsoft Corp. last week announced it will make its Internet Explorer 4.0 available to Windows 95 customers as a free download by the end of the summer. Versions that support Windows 3.1, Macintosh, Unix and Sun Microsystems, Inc. platforms will follow. Microsoft eventually will bundle the browser in Windows 98.

Sybase IQ to go NT route

Sybase, Inc. in Emeryville, Calif., will introduce a Windows NT version of its Sybase IQ decision-support database at the DCI Data Warehouse World conference this week in New York. Other expected announcements include a new release of data analysis tools from Burlington, Mass.-based Pilot Software, Inc., and a deal linking Information Builders, Inc.'s data access middleware to IBM's upcoming NotesPump data server.

Security for Java, ActiveX code

Internet Security Systems, Inc. (ISS) and **VeriSign, Inc.** have announced an alliance aimed at helping systems administrators control downloaded Java and ActiveX code on their network. Atlanta-based ISS said its network monitoring software will check Java applets and ActiveX controls for digital certificates issued by VeriSign in Mountain View, Calif. Administrators will be able to set the ISS software to reject any Java or ActiveX code that doesn't have an approved author certificate.

3Com, IBM join on ATM

3Com Corp. and **IBM** last week agreed to exchange Asynchronous Transfer Mode (ATM) technologies for future backbone switches. IBM said it will use 3Com's Gigabit Ethernet technology in its high-end 8260 switch. The pact also calls for IBM to resell 3Com's stackable workgroup switches. And IBM plans to provide ATM uplinks for some upcoming IBM and 3Com workgroup switches.

Microsoft loses on benefits

A federal appeals court has delivered another setback to **Microsoft** on the issue of freelance employees. An 11-judge panel of the 9th Circuit U.S. Court of Appeals ruled that hundreds of Microsoft employees may be entitled to pension and stock purchase benefits even though they had been hired by the software giant as independent contractors. Last October, a court found that Microsoft's temporary employees, because of their de facto full-time status, were entitled to the benefit programs.

Sun to ship directory server

Sun Microsystems this week will announce a directory server based on the Lightweight Directory Access Protocol. Sun Directory Services is aimed at companies that wish to manage worker information as well as network devices across an enterprise. Due in September, company officials said pricing starts at $995 per server.

SHORT TAKES **IBM** last week announced the availability of the first components of its Java-based architecture, called San Francisco, for building Web-based applications. The first tools are slated to ship this month. ... Germany-based **IDS Scheer, Inc.** said it will release next month ARIS Easy Design, a business-process modeling tool that can link corporate processes to the functions in SAP AG's R/3 package. ... **PeopleSoft, Inc.** last week bought **Campus Solutions, Inc.**, a Mission Hills, Calif., maker of student administration software, in a stock trade worth roughly $12.8 million.

Microsoft mounts NC counterattack

▸ *Vendor seeks to cut cost of ownership for Office, NT users*

By Laura DiDio and Carol Sliwa
SEATTLE

REDUCING TOTAL cost of ownership took center stage at Microsoft Corp.'s Windows Platform Briefing here last week.

Microsoft said when Windows NT 5.0 ships next year, the combination of its Active Directory, Zero Administration Kit and new Intellimirror caching will cut users' total cost of ownership by 50%.

Microsoft also said the next generation of the Office suite of desktop applications will cost half as much to use and maintain.

"This is clearly a reaction to the Oracles and the Suns of the world talking about network computing and how Office is expensive and hard to maintain. [Microsoft is] saying, 'Hey, we're going to make Office easier to use, and look at all these great things that we have in store,'" said Esther Schreiber, an analyst at CS First Boston Corp. in New York.

Thomas Maher, vice president of Lynch & Mayer, Inc., a money management firm in New York, said total cost of ownership is now Microsoft's priority "on every project."

"[Microsoft] is saying, 'Hey, we're going to make Office easier to use, and look at all these great things that we have in store.'"

— Esther Schreiber, CS First Boston

"The last time I heard that was with the Internet a couple years ago, and they really went from nowhere to dominant or close to dominant. If they can do the same thing, it might be something to look out for," Maher said.

Microsoft added that forthcoming releases will contain features such as better World Wide Web integration and a "self-repair" facility that will automatically fix common desktop problems.

Although Microsoft was implicitly acknowledging the importance of the network computer by its focus on cost of ownership, the firm's rhetoric remained dismissive. Paul Maritz, group vice president, said, "We don't see them gaining more than 2% of the desktop market."

Chairman Bill Gates said network computers are neither compatible with each other nor with PCs. He also said they overload servers, resulting in higher costs and less responsiveness.

However, executive vice president Steve Ballmer acknowledged that "a number" of Microsoft's large accounts are implementing pilot network computer networks. "If [network computers] do catch fire, they could retard PC growth rates, and that's a scary proposition for us," Ballmer admitted.

On the desktop front, Microsoft drove its Internet stake further in the ground with the demonstration of better Web integration in the forthcoming Windows 98, due out in about six months.

One of the few new features is a "channel bar" that will obviate the need for a separate browser. The channel bar will let users integrate lists of their favorite Internet channels or sites into their Windows 98 desktops. Users will simply have to point and click to open those sites.

But Microsoft officials also said the traditional Windows-based tool bars and menu icons won't go away. □

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Florida agency cracks down on 'net misuse

▸ *Fires employees for browsing sites unrelated to work*

By Patrick Thibodeau

A FLORIDA STATE welfare agency recently fired two employees for Internet misuse — one for browsing pornography and one for browsing the CNN news site and a Macintosh computing site.

Many government agencies and corporations have policies against downloading pornography and other Internet activity that could be a legal liability. But the Florida agency has an especially strict policy against Internet surfing unrelated to work.

"If it's not germane to your job, you are not free to use the Internet at any given point and time — even if you're here on a Saturday," said Beth Owen, a spokeswoman for the state Department of Children and Families for Palm Beach County.

The investigation was prompted by concerns about pornography but grew into a broader investigation of Internet misuse by the agency's 18 end users. The agency reviewed the bookmarks, history and cache files on employee workstations.

One of those dismissed, Keith Dubin, an attorney at the welfare office, had set the Cable News Network news site as the default home page on his browser. He said he often scanned the news looking for stories related to child welfare issues.

Dubin also acknowledged visiting some Macintosh computing sites while at work. But he said the state had no clear policy on Internet use. "If this becomes some sort of precedent, everybody is going to be in trouble," Dubin said. He is appealing his dismissal.

State agencies have to be concerned about public perceptions, said Nelson Kilmer, data processing administrator for the department. "If the person at the front desk is reading a golf magazine, that gives a bad impression to the public," he said. The same applies to computer games, he added.

On the other hand, Kilmer said, "I don't consider the occasional image of the *Palm Beach Post* home page necessarily a bad thing, if it showed up once in a cache file of 400 or 500 images."

> "If it's not germane to your job, you are not free to use the Internet at any given point and time"
>
> – Beth Owen, Florida Department of Children and Families

Many corporate information systems managers are wrestling with the same issues.

At Air Products and Chemicals, Inc. in Allentown, Pa., employees don't get Internet access until they have been through a training class that covers appropriate use. Employees are told that the Internet is intended for business use and that the company uses monitoring software, said Jack Fekula, manager of systems integrity.

Employees could get fired for visiting pornographic Web sites or running a business over the Internet from work. "I think it's the smart thing to do, because it protects the corporation," Fekula said.

Joanna L. Morgan, IS director at a Houston-based manufacturing company, said her company recently adopted an Internet use policy. "We were concerned about leaving ourselves open to sexual harassment suits if an employee were to bring up offensive material on the screen and expose other employees to it," she said. The company has installed software to conduct spot monitoring of employee Internet use. □

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Informix gets back to business despite management revamp

By Craig Stedman
SAN FRANCISCO

BUSINESS AS USUAL.

That was the prevailing view among Informix Software, Inc. customers after the struggling database vendor kicked CEO Phil White upstairs at the start of its annual user group conference here last week.

Informix brought in former 3Com Corp. executive Robert Finocchio Jr. to take over as president and CEO.

Informix users mostly remained calm after the company's $140 million first-quarter loss, and conference attendees here said the management shake-up caught them off guard and added an element of the unknown to the picture.

More than a half-dozen attendees said they took solace in comments by Finocchio that he doesn't expect to tinker heavily with the firm's product plans.

For example, Bank of America's global capital markets unit is waiting on extensions to Informix's Universal Server database before moving beyond the pilot stage on a multimedia World Wide Web site. The site will deliver research and analysis to external customers.

"If there was a change to slow that down and focus [Informix's development] in other areas, that would be a disappointment," said Jane Meyer, vice president of customer technologies for global capital markets at the San Francisco-based bank. "But that would be foolhardy for them to do."

CINDY CHARLES

Visa International's John Valente: "I have a lot of confidence in Informix, and I think [Finocchio] was a great find for them"

Informix's technology "still works for us, and I think their strategy is going to stay solid," said John Valente, senior vice president of the information applications division at Visa International, Inc. in San Francisco. Finocchio's hiring should restore Informix's credibility with Wall Street investors who were calling for White's head, he said.

Finocchio said he still needs to bone up on the Menlo Park, Calif., company's technology plans. But he said problems appear to have been fueled more by deficiencies in marketing and financial controls than by any product shortcomings.

BUSINESS ISSUES

"It's not as if I need to turn the company upside down and go into some business that we're not already in," Finocchio said.

Informix needed to "shake up the brew a little bit" to improve its external perception and prevent Oracle Corp. and other rivals from giving a marketing kiss of death to the firm, said Janice Richardson, manager of the city of Aurora's systems and operations division in Colorado.

TELL THE STORY

"Their technology still blows Oracle away, but they got slack on telling their story so people can understand it," said Richardson, who is a member of the International Informix Users Group's leadership council.

For a prospective database buyer, Oracle's size and stability are always a draw, said William Sammons, a systems development project supervisor at Dow Jones & Co. in Princeton, N.J. But the turmoil at Informix hasn't pushed him into Oracle's arms yet.

"I was a little surprised by the timing [of the management change], but I don't think it will have an impact on our decision," Sammons said. Dow Jones is weighing Universal Server against Oracle8 for a multimedia Web site that will feed information to its clients. □

CINDY CHARLES

New Informix President and CEO Robert Finocchio Jr. (left) says former CEO Phil White (right) "will help me get up to speed and then help with relationships and strategy"

CEO Finocchio vows to shore up database vendor

Robert Finocchio Jr. left his job as head of 3Com Corp.'s enterprise networking unit several months ago. He said he wanted to be his own boss. Last week, the 46-year-old Finocchio got the chance when Informix Software, Inc. named him president and CEO. At Informix's user group conference last week, he sat down for an interview with Computerworld *senior editor Craig Stedman.*

CW: What will be your working relationship with Phil White [the former CEO who is still chairman of Informix]?

FINOCCHIO: I report to the board, and all the people Phil had reporting to him now come to me. In a practical sense, I'll run the company, and Phil will help me get up to speed and then help with relationships and strategy.

CW: Do you expect major changes in product strategy?

FINOCCHIO: I don't know enough to say yet, but I don't think the problems center around products or technology. There's no issue here about whether the products work. What you're really left with are issues of business execution and a little lack of [marketing] clarity about who we are.

CW: What are the key problems that you need to fix?

FINOCCHIO: From what I know, a lot of the accountability and controls inside Informix haven't caught up with the growth of the company. We need to add a [chief financial officer] as quickly as possible. But there are no fatal issues there. It's all stuff that businesses should know how to do.

CW: Are more layoffs likely?

FINOCCHIO: We need to shore up our balance sheet, and to do that, we clearly need either more top-line revenue or lower expenses. Clearly, there are things in the mix of spending that we need to change. But I'm still working that out.

CW: How bad is the situation, and is it hurting Informix with prospective customers?

FINOCCHIO: When you look at what happened in the first quarter, the magnitude of that [loss] was pretty bad. It's important for us to show customers that we're going to fix what's broken, and I'm part of that. □

Lotus will ship low-end Web server

By Barb Cole-Gomolski

CALL IT THE official entry of Lotus Development Corp. into the World Wide Web server space.

Although it has been pushing its Domino server as a Web server for a year, Lotus next month will ship a low-end Web server that is more squarely aimed at offerings from Microsoft Corp. and Netscape Communications Corp., company officials said last week.

The Lotus Go Webserver was designed to help companies quickly get a Web server up and running. It lacks the electronic-mail and collaboration capabilities of Domino, but it doesn't require as much administration.

Lotus hopes to attract information systems shops that aren't using Domino and later upgrade them to Domino or one of IBM's collaboration servers, company officials said.

Go Webserver would have little appeal for most large Domino sites.

"It's good for companies that are just starting out [with Web development]," said Bill Wilson, manager of MIS at J&H Marsh & McLennan, an insurance company in New York and a large Domino user. "Companies like ours that already have a heavy investment in [Domino] will just stick with it."

STIFF COMPETITION

Competing with Microsoft and Netscape on the Web server front won't be easy, users said.

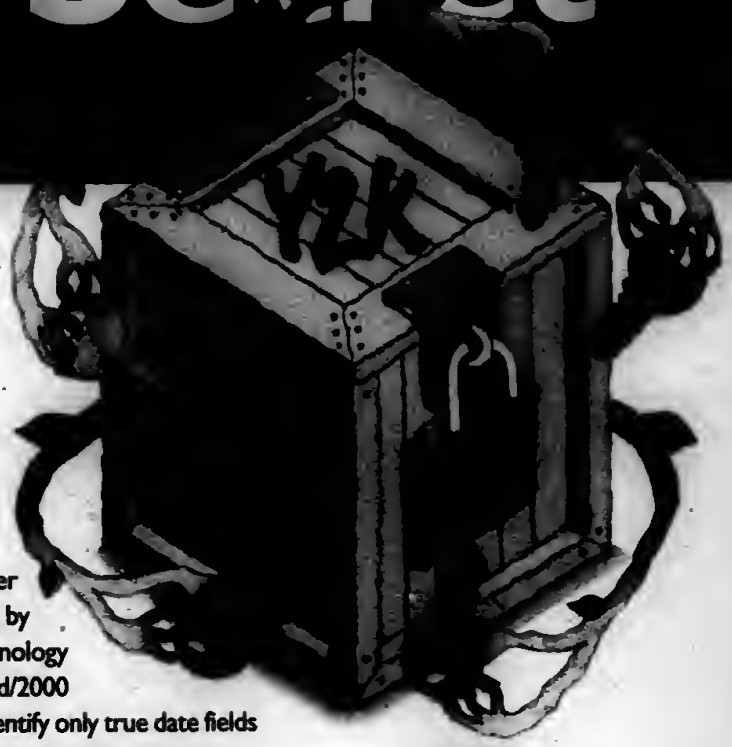
"Since [Microsoft Internet Information Server] is free with the purchase of Windows NT, any Web server that you have to pay for is a hard sell," said an implementation specialist at a large consumer products company in the eastern U.S.

Go Webserver costs $495 for the standard edition and $795 for a version that includes Web application tools.

Lotus officials said they hope that Go Webserver, which is a rebranded version of IBM's Internet Connection Server, will stand out from the competition in terms of scalability.

With support for midrange and mainframe platforms, it can outscale its competitors, company officials said. □

Their Ugly Little Secret



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While E-commerce firms sweat out shaky 'net reliability . . .

By Mitch Wagner and Sharon Gaudin
CHICAGO

DESPITE PERIODIC outages, companies continue to carefully wade on to the Internet, drawn by the low cost of doing certain types of non-time-sensitive activities.

Many companies are hoping that as they slowly ramp up their electronic-commerce efforts, Internet technology companies will improve the reliability of the network.

But the stability of the Internet simply isn't that much of a problem for most online ventures today because the stakes are so small, said attendees at Internet World/Summer '97 last week.

PHOTO BY BOB PEARSON

You have to design your site for trouble, because all devices fail at some time

"[The Internet] is going through some growing pains," said Jang Jeon, vice president of electronic commerce at Liberty Financial Cos. in Boston, an investment company with a personal-finance site on the Internet. "My contention is that the Internet is about to hit mainstream, but it's not there yet."

PLAN FOR PROBLEMS

Purveyors of serious commercial ventures on the Internet said unpredictability must be factored into the equation.

That means having backup plans in place and limiting 'net use to non-time-sensitive activities such as retail sales, banking and data searches. Those applications can be done by telephone or can wait a few hours if access to the Internet is blocked.

"Yeah, the Internet goes down, but so do my notebooks and servers and CC:Mail. You have to think about all that and design your system for trouble," said Matt Russo, Internet business systems manager at Minolta Corp. in Mahwah, N.J.

Minolta's site offers for its dealers technical information about the firm's laser printers. The company plans to enable the site for electronic commerce later this year.

The heavier the investment in the Internet, the higher the risk.

Manheim Auctions, for instance, runs an online site devoted to auctioning cars to used car dealers.

Manheim, a subsidiary of Cox Enterprises, Inc. in Atlanta, didn't suffer too seriously from a major outage earlier this month, said Ralph Liniado, senior vice president of development at Manheim. But if the Internet crashed so completely that users couldn't get online for a day or more, "we'd be screwed," he said.

To protect themselves, users should have alternative communications channels in place (see story at bottom right). They also should try to use the Internet only for business needs that won't cause crises if they are delayed by Internet outages.

"We'd be screwed" if users couldn't access Internet site for a day or more

The lure of the Internet is low cost, users and analysts said. Forrester Research, Inc. in Cambridge, Mass., has estimated that companies pay $30 per call for customer service via an 800-number, compared with $1.50 to $5 over the Internet.

Similarly, Wells Fargo Bank & Co. in San Francisco estimates that a customer transaction conducted over the Internet is 10 times less expensive than it is over an 800 line, at an automatic teller machine or at a bank branch (see related story, page 8).

The recent outages have failed to convince users that the Internet needs a central authority to govern reliability or to disseminate information.

To be more reliable, observers said, the Internet needs decentralized control and freedom to mature under competitive pressure. □

& **Wal-Mart and others are testing secure Internet payments. Page 41**

Keeping sites open

An essential component of doing business on the Internet is making sure the Internet connection stays up — and having a plan in place for those inevitable times when the connection crashes anyway, Internet business managers said.

Protection measures include maintaining backup sites locally; having "mirror" sites in distributed locations; and buying connectivity from multiple Internet service providers.

Internet businesses also need a way to communicate with customers when their Internet connection goes down. For example, Bryan Hertz, CEO at Internet and Web Services in San Diego, which runs 1World Plaza, an online shopping mall, said his company keeps servers in multiple, earthquake-proof locations and has multiple Internet service providers. "The only way we'd be affected is if the entire West Coast fell off the map," Hertz said.

Phone-in help lines and fax lines that back up users who are stuck without Internet connection are essential, said Tom Bongiovanni, national demand manager at Heineken USA, Inc. in White Plains, N.Y. The company maintains an Internet site for its U.S. distributors.

In many cases, the Internet is simply a new way of doing the same old business a company has always been doing. At Wells Fargo, for example, customers who lose their Internet connections can simply call a bank-by-phone service or go to an ATM.

And to really protect against Internet outages, users can build their own Internet. The Automotive Industry Action Group is building a private Internet to solve the reliability problems of the public 'net. The group also is building an extranet to serve thousands of suppliers, manufacturers and other business partners in the automotive industry, including Chrysler Corp., Ford Motor Co. and General Motors Corp. — Mitch Wagner and Sharon Gaudin

. . . vendors seek to assuage fears with bevy of products and services

By Mitch Wagner
CHICAGO

IBM AND ORACLE CORP. last week were among vendors that announced products and services designed to improve the reliability, security and robustness of Internet-based commerce.

IBM Global Services announced an agreement with WheelGroup Corp. in San Antonio to provide real-time intrusion-detection services for IBM customers' networks.

ON THE WAY

IBM can deploy the software on corporate user networks, monitoring for security violations and intrusion attempts.

Other announcements made at Internet World/Summer '97 included the following:

- Lotus Development Corp. announced a developer kit for the Domino Instant Host platforms. The kit helps developers build rentable Internet applications.
- IBM also announced World Wide Web hosting services, including design services and a fill-in-the-blanks template for building company home pages.
- Oracle Corp. said it will integrate payment-processing software from ICVerify, Inc. in Oakland, Calif., into Oracle's Internet commerce software. The software processes Visa, MasterCard and private-label credit-card transactions.
- Bluestone Software, Inc. in Mount Laurel, N.J., announced an upgrade to its Sapphire/Web tool kit designed for building Web applications that access databases and client/server applications. The software lets users deploy client components as Java applets or as Java code running on a server.
- Open Text Corp. in Waterloo, Canada, and Hewlett-Packard Co. in Palo Alto, Calif., demonstrated a jointly developed tool kit for building network computer applications incorporating document management, workflow, search and collaborative features. □

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Insurer fibs its way past Y2K

CONTINUED FROM COVER 1

"The choice we had was to pay millions and not be guaranteed to make the deadline — we were being told to buy vaporware," said Brown, vice president of information systems at the $51 million Sandy Springs, Md., company.

Instead, Brown lied — to the mainframe.

All the dates in the system were shifted back 28 years, when the calendar was the same as it is this year. So the mainframe thinks this year is 1969, last year was 1968 and next year will be 1970.

That gives Montgomery Mutual 31 years to decide whether to completely upgrade the application, buy a new package or get off the mainframe.

"We are used to lying to this thing [the mainframe application] anyway," Brown said. For example, client/server applications access mainframe data while thinking they are being accessed by a terminal.

Of course, the rest of the world is operating under the assumption that it is 1997, not 1969, so Brown uses Hypertext Markup Language conversion software from Teubner & Associates, Inc. in Stillwater, Okla., to present the correct dates to users who access the VSE/ESA mainframe application from World Wide Web browsers.

So anything the application thinks is 1969 comes up 1997 on the browser. "We have wrapped everything around it, so we control all the data coming in and out," Brown said.

Montgomery Mutual's Adrian Brown: The firm avoided a costly year 2000 upgrade by pulling a fast one on its mainframe

Year 2000 experts said this method called masking or encapsulation, helps because users don't have to do expensive application and database work. But there could be unknown problems and performance hits down the road.

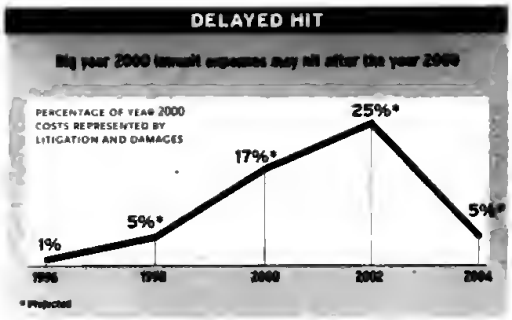
"These methods are becoming common as users have less time to do a complete year 2000 effort," said Capers Jones, chairman of Software Productivity Research, Inc., a software and consulting firm in Burlington, Mass. (see related story at right). "But although it is quick and seems to be effective in the short term, it is not clear what obscure date problems may crop up in the future."

That could pose problems for large shops that have lots of in-house and packaged applications. Masking is typically viewed as a temporary measure to carry users forward until they have time to replace or rewrite an application.

In Montgomery Mutual's case, the masking was limited to the one policy administration application, and more and more of its duties are slowly being managed by client/server systems.

"We keep moving away from the mainframe and taking chunks out to other client/server applications," Brown said.

But the payoff in the short term was significant: The total project, which was initiated in April and is expected to go live next month, cost $500,000. That includes two new IBM R/390s (an RS/6000 server that runs a mainframe processor) to replace the aging IBM 4381 system, which was costly to maintain and took up a lot of space. □



Millennium legal costs could top $100 billion

By Robert L. Scheier

LAWYERS, start your engines.

Whenever software fails because it can't distinguish between the 20th and 21st centuries, chances are a lawyer will be around to file a lawsuit.

Some experts estimate that litigation and damages could cost more than $100 billion in the U.S. alone. Nervous information systems managers are starting to build defenses against such suits.

"Just this morning, we set up an appointment with our lawyer," said Dave Bettinger, year 2000 project communications specialist at direct-mail retailer L. L. Bean, Inc. in Freeport, Maine. Bettinger's team wants legal advice on how to enforce compliance among L. L. Bean's suppliers and how to protect L. L. Bean from future suits.

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"Never in human history has there been a technical problem that had the potential to trigger so many lawsuits," he wrote in *The Economic Impact of the Year 2000 Problem*, which is slated to be published in November.

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Rather than try to predict exactly how much year 2000 litigation would cost, Jones said the estimates are an attempt to compare post-year 2000 costs with the costs of fixing the problem.

Despite the high margin of error, he wrote, post-year 2000 costs such as litigation "are more than an order of magnitude more expensive than any of the year 2000 repairs."

"I think there's a lot of lawyers who would love it to be that big, but I don't think there's going to be that much to sue over," said Marvin Thornton, year 2000 project manager at Southtrust Data Services, Inc. in Birmingham, Ala., the IS arm of Southtrust Bank. "I think it's consultant hype." He said he expects to minimize Southtrust's legal risk by disclosing its year 2000 problems to shareholders, documenting its year 2000 efforts and working with other banks to make sure its year 2000 work is up to industry standards. □

Mac OS 8 bows, but lacks memory piece

By Wylie Wong

APPLE COMPUTER, INC. die-hards finally have something to cheer about: the release of Mac OS 8. But users still yearn for the memory protection already available in the rival Windows NT operating system.

The Mac OS upgrade features a PowerPC-native Finder that lets users do multitasking, such as copying several files while performing other functions. For better file management, users can drag files on top of folders, and the folders will pop open automatically.

Mac OS 8 users can also place folders and hard drives at the bottom of the screen and open them with a single mouse click. Cosmetically, the user interface has a three-dimensional look.

Norman Eide, vice president of information systems at HDR Insurance Services in Sacramento, Calif., said the PowerPC-native Finder is the most valuable new function. But he said Macintosh users still need protected memory, which prevents the computer from crashing if one application crashes.

"I've been using Windows NT 4.0 since [last year], and I've never had to restart" the computer after an application crash, said Eide, whose office has a mix of Windows and Macintosh machines. "On the Mac, you're restarting all the time."

ADVANTAGES

Apple, in Cupertino, Calif., will offer memory protection when it releases Rhapsody, its next-generation operating system, in the middle of next year.

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Other upgrade features include the ability to turn the Macintosh into a World Wide Web server; Mac OS Runtime for Java; and an Internet Set Up Assistant.

Mac OS 8 is available now. It requires at least 12M bytes of RAM and works with computers that use the 68040 and PowerPC chips. It costs $99 on CD-ROM. Mac OS 7.6 and 7.6.1 users can receive a $30 rebate. □

Insurer fibs its way past Y2K

CONTINUED FROM COVER 1

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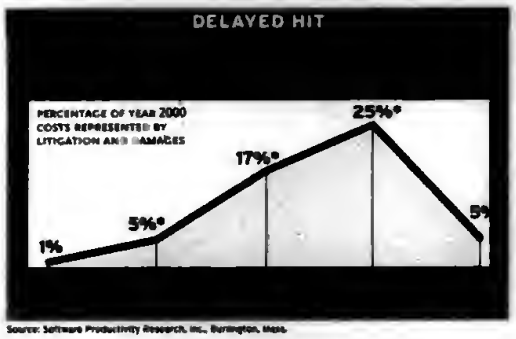

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Microsoft declares war

CONTINUED FROM COVER 1

Windows. "They are trying to get this to be a runtime layer to which application vendors write their applications. Those are the APIs they want people to write to. We want them to write to the Windows APIs."

Hence Microsoft's decision to not ship the JFCs.

Also describing the Java Foundation Classes as "a competing operating system" to Windows, was Microsoft Group Vice President Paul Maritz. He insisted in a separate interview that the company isn't legally required to include Sun's JFCs with Windows, Internet Explorer or any Microsoft product.

"We have no intention of shipping another bloated operating system and forcing that down the throats of our Windows customers," Maritz said.

MAKING A CHOICE

That means developers will either be forced to choose between Sun and Microsoft class libraries or have to write separate applications. And end users will have to make sure they have both sets of class libraries on their systems if they want quick access to those applications.

That effectively defeats the "write-once, run-anywhere" appeal of Java.

Sun officials rejected the description of JFCs as an operating system, and a bloated one at that.

"It's clear that Microsoft wants to stop Java," said an information technology development executive at a Fortune 200 company who asked not to be identified.

It is really shaping up as Microsoft vs. a consortium of Sun, Netscape Communications Corp. and IBM, the executive said. "And [Microsoft] clearly doesn't care about their users, because it would be easy for them to just pick up the JFCs and make that part of their virtual machine," he said.

"It feels like this is the school yard, and Microsoft is that tough guy on the other side of the fence," said Scott Hanselman, a senior software engineer at Portland, Ore.-based Step Technology, Inc. The company recently developed a Java customer service application for an international apparel maker. "Microsoft is trying to sell us crack, and the first taste is free. But what's it going to mean when we're addicted to this?"

WHAT LIES AHEAD?

Worse yet, Hanselman said, is what may be coming in the future. He said he envisions a day in which everyone will need multiple virtual machines in their browsers to run Java applications. The virtual machines will have to be updated like software, Hanselman said.

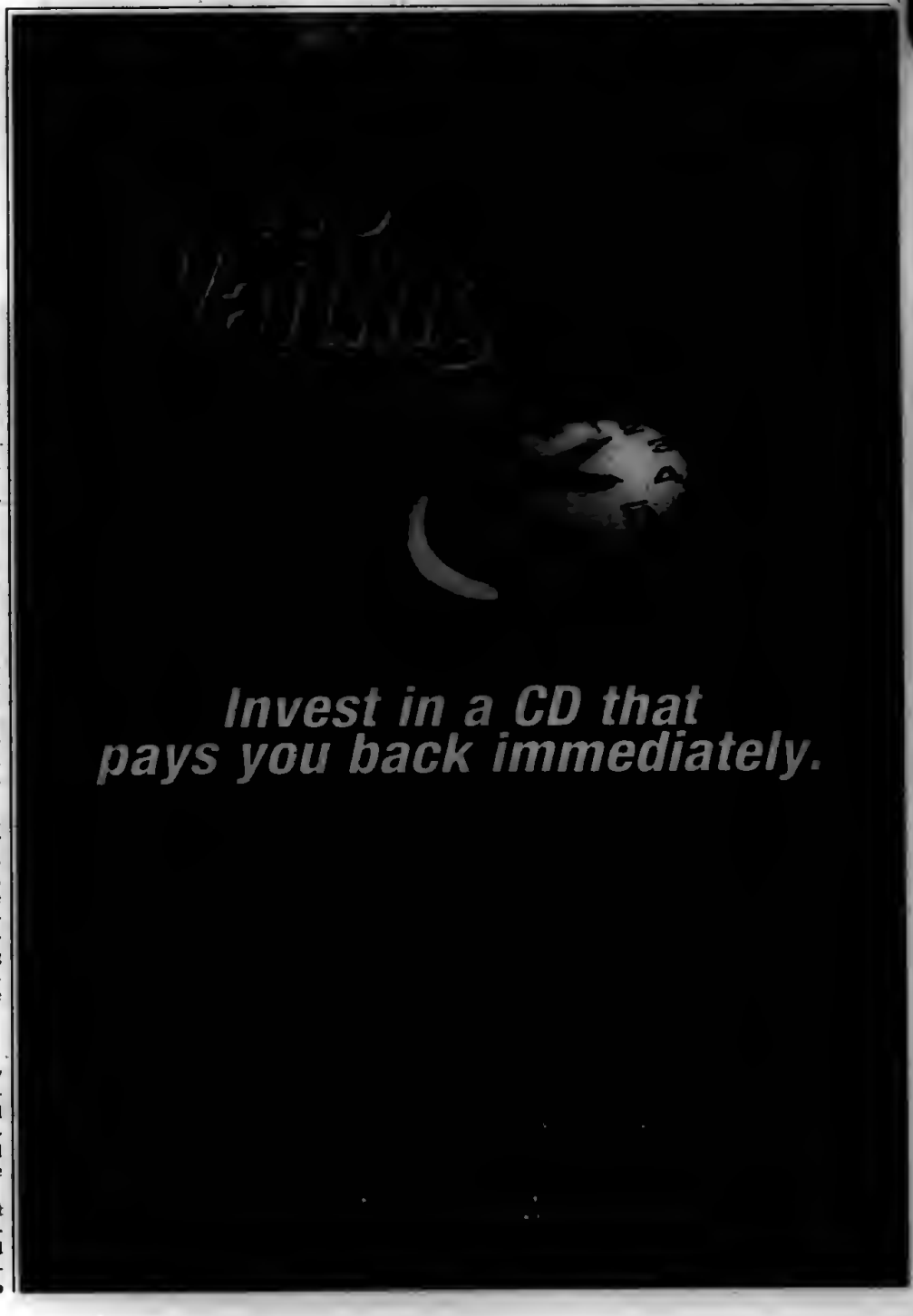
Ballmer, however, insisted Microsoft doesn't have a problem with the Java language. "We think there's a lot of good stuff that's coming out of the Java development environment. We're going to support that ... to let people do great Windows applications in it."

"All of our licensees have to ship the core part of Java, and JFC is part of that," said John Kannegaard, vice president of software products at Sun's JavaSoft's division.

Sun officials, meanwhile, expressed surprise at Maritz's comments. "Microsoft has always shown they will deliver when developers want something, and I'm confident developers will want JFCs," Kannegaard said.

But other users said they had always been skeptical of Java's ability to deliver on its cross-platform promises. "Java is not purely cross-platform, and it never will be," said Dave Schrier, director of product development at Black Diamond Consulting in Portsmouth, N.H. "That's just philosophical. Everyone wants to do their own thing, so Java will never be cross-platform."

"It's like telling Ford to use the same parts as GM. They both have tires and use gas, but other than that, it's just not going to happen," Schrier said. □



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Component-based developers face many issues

By Craig Stedman
SAN FRANCISCO

THE BRAVE NEW WORLD of component-based development remains uncharted territory for many IS departments.

The idea of creating or modifying applications by snapping together chunks of object code promises to let corporate developers respond more quickly to business needs. But information managers at last week's OBJECT WORLD Object World West '97 conference here said many issues must be resolved before they can make that vision a reality.

"We're a long way from being ready for components," said Lander Stoddard, a divisional manager of computer resources at the Centers for Disease Control and Prevention in Atlanta. "Our central [IS] group is really just at the front end of client/server development, and asking them to swallow distributed objects is too much right now."

Component-based development herds software code into reusable modules that can automate business processes. Vying for supremacy in the component world are Java and the Object Management Group's Common Object Request Broker Architecture on one side and Microsoft Corp.'s ActiveX and Distributed Common Object Model on the other.

The path to components

1. Make sure business needs are understood
2. Assess developer readiness and training needs
3. Set architectural and component design guidelines
4. Create policies for reusing components
5. Devise component testing and certification routines

Source: Genesis Development Corp., West Chester, Pa.

But Stoddard and other Object World attendees said the potential roadblocks they face range from major retraining issues to testing uncertainties to the political minefield of trying to get autonomous business units to agree on corporate component standards.

Lucent Technologies, Inc. last month went live with an object-based customer support application and sees components as "the next logical step," said Sue Lovell, a technical staff member at the telecommunications equipment manufacturer in Murray Hill, N.J.

"We all know we have to get there, but it's going to take a lot of retraining to get us up to speed compared with what we're used to," she said. "This is so different."

Getting different parts of the company to standardize on a common component architecture also could be "a big challenge," Lovell said. But component proponents view that as a key element to ensuring that code modules can be used in a mix of applications.

A major aerospace company spent much of the past year trying to piece together a single architectural framework for components before throwing up its hands and settling for a less complex strategy of making sure that different approaches can interoperate.

"We're a very large organization, and trying to get a common set of practices in place is hard," said a technology manager at the company, who asked not to be identified. "You get into the religious wars of Microsoft against the rest of the world." □

"With NCD, 'Power Windows' will be standard equipment at Rover."
HOW ARE NETWORK COMPUTERS IMPACTING THE HIGHLY-COMPETITIVE AUTO INDUSTRY?
Britain's Rover Group recently completed installation of over 700 network computers from NCD. Explora™ NCs give users direct access to any application, anywhere on the network including legacy and developing applications. Currently, NC desktops provide parts management, Bill of Materials systems and much more. "We're also extending capabilities of the NCs in the production environment" said David Ward, Rover's Engineering Systems Architecture Consultant. What's more, NCs will be powering up Windows™ at Rover.
Rover is planning to use NCD's WinCenter Pro™ running on NT as a "Microsoft® application server," allowing each single desktop device to easily access Windows apps. The user simply clicks on the application icon and the server delivers the application. "While there will always be a place for the PC, we're impressed by this desktop solution which makes it simple for NC and workstation users to access all the MS-based applications" said Ward.
NCD is the recognized leader in thin-client network access devices, with more than 350,000 installed worldwide. We're proud to provide network solutions for innovative companies such as Rover Group.
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Bay cuts cost of switched Ethernet on desktops

By Bob Wallace and Laura DiDio

BAY NETWORKS, INC. this week will make an appeal to cost-conscious users who want a cheaper way to build and expand switched Ethernet networks to the desktop.

By cutting the cost in half, the new switches should give users an alternative to buying higher-end systems that could force them to disturb network infrastructure to provide switching to the desktop. Called the BayStack 303 and 304, they can be stacked for expansion, which lets users pay as they grow.

Stackable systems give users more flexibility than chassis-based systems by letting them mix switching, routing, remote access and network management functions in one stack of small, easy-to-administer devices.

The BayStack 303 costs $94 per port, and the BayStack 304 costs $125 per port. A comparable chassis-based Bay system costs much more than $200 per port.

"Our company is going through a [geographic] dispersion and requires systems that are convenient and scalable, because it would be impractical and expensive to put larger systems in everywhere," said Earl Perkins, manager of network projects at Entergy Services, Inc., a utility in Gretna, La., that is a Bay customer. "We're excited that the cost per port has been halved, which, along with [integrated] network management, will go a long way to helping us make a decision on what to do in our wiring closets."

"Bay needs to put substance behind its Adaptive [Networking] strategy to attract new business and maintain its installed base."
– Eric Hindin, The Yankee Group

Analysts said the switch announcements put muscle behind Bay's new networking strategy. Bay in May unveiled its Adaptive Networking strategy, which was designed to give users devices to help them migrate to IP networks. Bay is filling in gaping holes in its switching product line.

"Bay needs to put substance behind its Adaptive strategy to attract new business and maintain its installed base. But this is a good start with respect to the switching component of Adaptive," said Eric Hindin, an analyst at The Yankee Group in Boston. He declined to comment on the specifics of the announcement. Bay still must make similar breakthroughs in remote access, management and IP services to be on its way, he added.

Bay's entry into the stackable Ethernet switch market will likely force other vendors to cut pricing or introduce lower-cost versions of existing switches, Hindin said. 3Com Corp., Hewlett-Packard Co. and Cisco Systems, Inc. account for most of the stackable switch market. Each offers products similar to the BayStack 303 and 304.

HP is considering price reductions on its stackable Ethernet switches but hasn't made a decision, said a company spokesman. Cisco and 3Com officials said they have no plans to reduce prices. □

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KEYNOTE SPEAKERS

Michael Dertouzos
Director of MIT's prestigious Laboratory for Computer Science and the author of the new book *What Will Be: How the New World of Information Will Change our Lives*, will kick off the conference with a lively discussion about the future of the World Wide Web and the Internet. He is just one of the high-level keynote speakers featured at the conference.

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SECOND-QUARTER FINANCIALS*

Sun rises in high-end storage

▸ *Division rolls out high-end disk arrays*

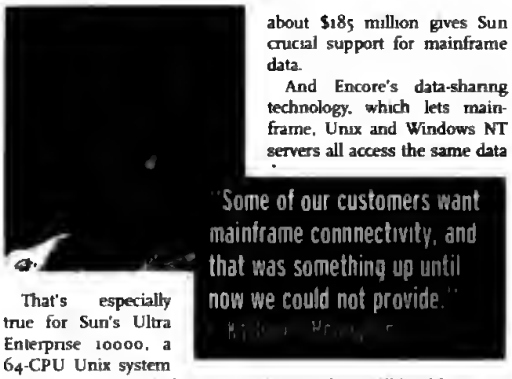
By Tim Ouellette

SUN MICROSYSTEMS, Inc.'s newest business strategy doesn't revolve around Java or Unix.

That's because the Silicon Valley innovator knows where the real money is: storage.

In the past year, Sun's separate storage division has received doubled investment, rolled out high-end disk arrays and this week will finalize the purchase of Encore Computer Corp., a maker of disk systems that house both mainframe and Unix server data in one box.

Driving those moves is Sun's push into the enterprise space. It needs reliable storage systems to lend credibility and reliability to its network-centric product offerings such as Java.



That's especially true for Sun's Ultra Enterprise 10000, a 64-CPU Unix system promoted as a mainframe replacement box [CW, Jan. 13].

"How could they sell the Ultra 10000 as a mainframe replacement when they couldn't support existing mainframe data?" said Tom Lahive, an analyst at Dataquest in San Jose, Calif.

The deal to buy privately held Encore in Melbourne, Fla., for about $185 million gives Sun crucial support for mainframe data.

And Encore's data-sharing technology, which lets mainframe, Unix and Windows NT servers all access the same data in one place, will be able to give Sun a feature now offered only by storage market leader EMC Corp.

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By Sharon Machlis

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McAfee denied the charges and said it will countersue for defamation, as well as demand Symantec be held in contempt of court for issuing public statements about the case in violation of a court order. In a statement issued last week, McAfee's general manager of network security, Peter Watkins, said the allegations are "without merit" and "in light of Symantec's behavior, McAfee has ceased discussions with Symantec until further notice."

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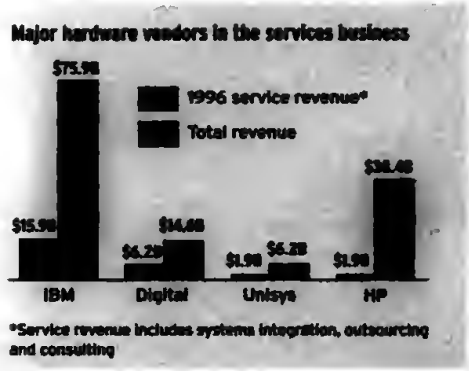
Hardware vendors profit from integration push

By Jaikumar Vijayan

THE SYSTEMS INTEGRATION market is providing a much-needed source of revenue for old-line hardware makers.

Pushed by falling hardware margins and surging customer demand, many of the top systems vendors are building profitable businesses by offering corporations a range of multiplatform support, application development and integration



Source: Vendors' annual reports

MCI: Keep 'net tax-free, open-market

By Matt Hamblen

MCI Communications Corp. last week unveiled an Internet policy that endorses the tax-free and open-market electronic commerce positions President Clinton espoused last month.

But on key recovery and other encryption issues, MCI joined most of the private sector in urging that government limits be lifted on encryption software sold abroad and supporting legislation that forbids government-mandated key recovery encryption.

MCI's policy, which can be found at *www.mci.com*, covers the gamut of electronic commerce issues such as protecting consumer and child privacy and intellectual rights. Analysts said the policy was probably the most comprehensive one issued by a major Internet service provider and telecommunications company.

Analyst Carl Howe, director of network strategies at Forrester Research, Inc. in Cambridge, Mass., said it is "good marketing" for MCI to post such a policy and to state for the record how the company stands in relationship to the government on various issues. The policy also includes a section in plain English on how the Internet works

In its policy statement, MCI reiterated its earlier endorsement of an accord signed by dozens of organizations in Geneva in April that urged expansion of the number of top-level domain names to include .firm and other extensions. It also called for a raft of registrars of domain names worldwide.

U.S. officials haven't endorsed that approach as many major U.S. companies that use the Internet have. The U.S. Department of Commerce is accepting public comment on domain name registration reform.

One problem of the accord, said Vinton Cerf, MCI's senior vice president of Internet architecture and engineering, is that software isn't available to prevent two groups from simultaneously registering the same domain name with two or more registrars somewhere in the world.

Cerf said such software needs to be developed by year's end in order for the accord to move forward and registrations to begin under the proposed system by April.

The Internet Engineering Task Force is the best place for such software to be developed, Cerf said. □

services.

And that could mean better prices and a lot more choice for users, analysts said.

Leading the hardware brigade are vendors such as Digital Equipment Corp., Unisys Corp., IBM and Hewlett-Packard Co.

The moves are increasingly pitting systems vendors against traditional Big Six integrators such as Electronic Data Systems Corp., Andersen Consulting and Computer Sciences Corp. At stake is a market estimated at $35 billion this year and predicted to reach $60 billion by 2001, according to International Data Corp. in Framingham, Mass.

"A lot of hardware vendors are emphasizing service because that is where all the profits are going to be" over the next few years, said Steve McClellan, an analyst at Merrill Lynch & Co. in San Francisco.

Already, service accounts for a significant portion of the revenue and profits for hardware vendors in the business — and it is growing fast. Last year, global services contributed $15.9 billion — $4.8 billion in systems integration — of IBM's total revenue of $75.9 billion. In the first six months of this year, revenue from the integration business grew by 25.6% compared with the same period last year.

Similarly, $6.2 billion of Digital's $14.6 billion in revenue last year came from services. And $1.9 billion of Unisys' $6.2 billion in revenue last year came from the services business, which has grown by 11% so far this year.

"Customers are much more willing to go outside today because the skills shortage is so tremendous within their own organizations," said Susan Scrupski, editor of "IT Services Letter," a newsletter in Woodcliff Lake, N.J.

"What hardware vendors have as an advantage [over traditional systems integrators] is the decades-old relationships with their installed base," Scrupski said. That could result in a better understanding of a customer's platform and integration requirements, she said. □

House committee approves software encryption bill

By Sharon Machlis

LEGISLATION TO loosen encryption export rules passed another congressional hurdle last week when the House International Relations Committee endorsed the Security and Freedom Through Encryption Act (SAFE) on a voice vote.

SAFE, backed by several industry lobbying groups, would allow export of any encryption software if such products are already available elsewhere in the world. It also would prohibit the U.S. government from developing mandatory key escrow programs. Such programs require users to store their coding/decoding keys with a third party in the event encrypted data is sought by law-enforcement officials.

Contrasting encryption bills are going through Congress

"Key recovery methods have a place ... but should not be mandated by the U.S. government," said Vinton Cerf, senior vice president of Internet architecture and engineering at MCI Communications Corp., in a news conference about federal technology policies.

The SAFE bill stands in sharp contrast to a measure now moving through the U.S. Senate. Called the Secure Public Networks Act, it is sponsored by Sens. John McCain (R-Ariz.) and Bob Kerrey (D-Neb.)

The McCain-Kerrey proposal would create a federal key-recovery system for use by the government and any network that receives federal funds. It also would retain most current restrictions on the export of strong encryption. It has been endorsed by the Senate Commerce Committee but has garnered sharp opposition from the computer industry.

In the House, several other committees, including National Security, have until Sept. 5 to vote on SAFE, which has already passed the powerful Judiciary Committee. □

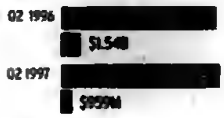
Matt Hamblen contributed to this story.

SECOND-QUARTER FINANCIALS

Computer Industry

SECOND-QUARTER FINANCIALS*

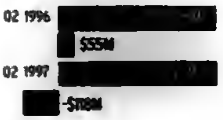
AT&T



Percentage change
Revenue: 1% Profit: -39%

Long-distance volume was up, but profits were hurt by massive investments in the local phone market and Internet and wireless services.

Bay Networks



Percentage change
Revenue: 1% Profit: -315%

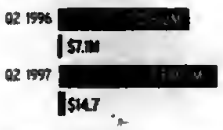
Without a $148M charge associated with two acquisitions, Bay would have earned $30M.

Computer Associates

Percentage change
Revenue: 12% Profit: 30%

Software sales jumped 51%, led by Unicenter TNG.

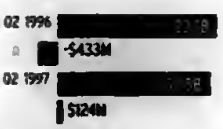
Data General



Percentage change
Revenue: 21% Profit: 107%

DG's Aviion line of Intel servers and its Clariion storage products drove the company's comeback.

Digital



Percentage change
Revenue: -5.7% Profit: 129%

Revenue declined, but margins increased. Windows NT sales were strong.

*Reflects calendar quarter

Sun rises in high-end storage

▸ *Division rolls out high-end disk arrays*

By Tim Ouellette

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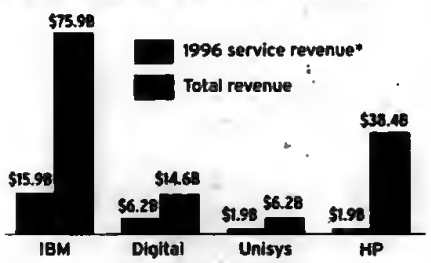
Pushed by falling hardware margins and surging customer demand, many of the top systems vendors are building profitable businesses by offering corporations a range of multiplatform support, application development and integration

Major hardware vendors in the services business



*Service revenue includes systems integration, outsourcing and consulting

Source: Vendors' annual reports

MCI: Keep 'net tax-free, open-market

By Matt Hamblen

MCI Communications Corp. last week unveiled an Internet policy that endorses the tax-free and open-market electronic commerce positions President Clinton espoused last month.

But on key recovery and other encryption issues, MCI joined most of the private sector in urging that government limits be lifted on encryption software sold abroad and supporting legislation that forbids government-mandated key recovery encryption.

MCI's policy, which can be found at *www.mci.com*, covers the gamut of electronic commerce issues such as protecting consumer and child privacy and intellectual rights. Analysts said the policy was probably the most comprehensive one issued by a major Internet service provider and telecommunications company.

Analyst Carl Howe, director of network strategies at Forrester Research, Inc. in Cambridge, Mass., said it is "good marketing" for MCI to post such a policy and to state for the record how the company stands in relationship to the government on various issues. The policy also includes a section in plain English on how the Internet works.

In its policy statement, MCI reiterated its earlier endorsement of an accord signed by dozens of organizations in Geneva in April that urged expansion of the number of top-level domain names to include firm and other extensions. It also called for a raft of registrars of domain names worldwide.

U.S. officials haven't endorsed that approach as many major U.S. companies that use the Internet have. The U.S. Department of Commerce is accepting public comment on domain name registration reform.

One problem of the accord, said Vinton Cerf, MCI's senior vice president of Internet architecture and engineering, is that software isn't available to prevent two groups from simultaneously registering the same domain name with two or more registrars somewhere in the world.

Cerf said such software needs to be developed by year's end in order for the accord to move forward and registrations to begin under the proposed system by April.

The Internet Engineering Task Force is the best place for such software to be developed, Cerf said. □

services.

And that could mean better prices and a lot more choice for users, analysts said.

Leading the hardware brigade are vendors such as Digital Equipment Corp., Unisys Corp., IBM and Hewlett-Packard Co.

The moves are increasingly pitting systems vendors against traditional Big Six integrators such as Electronic Data Systems Corp., Andersen Consulting and Computer Sciences Corp. At stake is a market estimated at $35 billion this year and predicted to reach $60 billion by 2001, according to International Data Corp. in Framingham, Mass.

"A lot of hardware vendors are emphasizing service because that is where all the profits are going to be" over the next few years, said Steve McClellan, an analyst at Merrill Lynch & Co. in San Francisco.

Already, service accounts for a significant portion of the revenue and profits for hardware vendors in the business — and it is growing fast. Last year, global services contributed $15.9 billion — $4.8 billion in systems integration — of IBM's total revenue of $75.9 billion. In the first six months of this year, revenue from the integration business grew by 25.6% compared with the same period last year.

Similarly, $6.2 billion of Digital's $14.6 billion in revenue last year came from services. And $1.9 billion of Unisys' $6.2 billion in revenue last year came from the services business, which has grown by 11% so far this year.

"Customers are much more willing to go outside today because the skills shortage is so tremendous within their own organizations," said Susan Scrupski, editor of "IT Services Letter," a newsletter in Woodcliff Lake, N.J.

"What hardware vendors have as an advantage [over traditional systems integrators] is the decades-old relationships with their installed base," Scrupski said. That could result in a better understanding of a customer's platform and integration requirements, she said. □

House committee approves software encryption bill

By Sharon Machlis

LEGISLATION TO loosen encryption export rules passed another congressional hurdle last week when the House International Relations Committee endorsed the Security and Freedom Through Encryption Act (SAFE) on a voice vote.

SAFE, backed by several industry lobbying groups, would allow export of any encryption software if such products are already available elsewhere in the world. It also would prohibit the U.S. government from developing mandatory key escrow programs. Such programs require users to store their coding/decoding keys with a third party in the event encrypted data is sought by law-enforcement officials.

Contrasting encryption bills are going through Congress

"Key recovery methods have a place . . . but should not be mandated by the U.S. government," said Vinton Cerf, senior vice president of Internet architecture and engineering at MCI Communications Corp., in a news conference about federal technology policies.

The SAFE bill stands in sharp contrast to a measure now moving through the U.S. Senate. Called the Secure Public Networks Act, it is sponsored by Sens. John McCain (R-Ariz.) and Bob Kerrey (D-Neb.).

The McCain-Kerrey proposal would create a federal key-recovery system for use by the government and any network that receives federal funds. It also would retain most current restrictions on the export of strong encryption. It has been endorsed by the Senate Commerce Committee but has garnered sharp opposition from the computer industry.

In the House, several other committees, including National Security, have until Sept. 5 to vote on SAFE, which has already passed the powerful Judiciary Committee. □

Matt Hamblen contributed to this story.

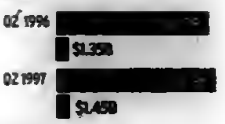
SECOND-QUARTER FINANCIALS*

EMC

Percentage change
Revenue: 31% Profit: 49%

Open systems revenue exceeded mainframe storage revenue for the first time.

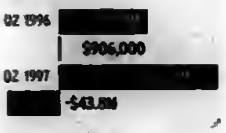
IBM



Percentage change
Revenue: 3.8% Profit: 7.4%

Mainframe revenue was flat, with price cuts offsetting a 60% increase in units sold. AS/400 and RS/6000 sales slumped.

Netscape



Percentage change
Revenue: 80% Profit: -4,934%

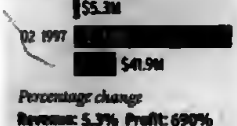
Excluding a one-time acquisition charge, Netscape earned $8.8M. Its browser market share seems to be stabilizing at about 66%.

Storage Technology

Percentage change
Revenue: 7.9% Profit: -30%

Disk storage sales rose as a result of a reseller agreement with IBM.

Unisys



Percentage change
Revenue: 5.3% Profit: 690%

Sales of ClearPath mainframes and increased service business fueled the company's rebound.

*Reflects calendar quarter

"Gee, Frank.
Maybe you should take the rest of the day off."

Sanity—wrapped up nicely in a cardboard box.

Reduce irritating questions by 47%.

Spend more quality time configuring hardware.

Play QUAKE—without the annoying interruptions.

Microsoft® Exchange Server is designed to make your life easier in two basic ways.

First, Exchange delivers all the stuff your end users tend to clamor for—e-mail and scheduling and discussion groups and task lists and Internet capabilities. And, thanks to its elite team of mail routers and file savers, their messages always get delivered. Happy users are quiet users.

Second, Exchange Server is remarkably flexible and easy to administer. It supports all current Internet standards and protocols and it works with all major network environments. Centralized administration lets you configure Internet gateways, add and delete users, track messages and even reboot—using one friendly interface on a single machine. Automated Exchange System Attendants even watch over your server and connection status, responding to problems by restarting the server or notifying you—before you get the bothersome phone calls. Plus, Exchange's tight integration with Windows NT® Server lets you reap the benefits of advanced security features and helpful management tools like the performance monitor and event log.

Exchange Server is just one of the integrated Microsoft BackOffice® server products that can be customized to solve tons of your frustrating business problems. To learn more about Microsoft Exchange Server, and to get a free evaluation copy, please visit our Web site.

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OPINION

Big money I used to think that TV weathermen had the best jobs.

They're consistently wrong, and they get to keep their jobs anyway. What a deal.

But that was before I learned about CEO pay. Not just any CEO pay, but *failed* CEO pay. Now that's where the really big money is.

Everyone else takes their chances in the job market. But for some reason, we have to guarantee CEO futures — even when they stink at their jobs.

Take Gilbert Amelio's golden parachute. The former Apple CEO's contract was worded so that he actually got more money for being asked to leave (for screwing up) than he would have if he'd done a good job. Apple lost $56 million in its last quarter, and at least one analyst has predicted a $458 million loss for the year.

You might say, "Wow." You should ask, "Why?"

Consider Bob Allen at AT&T. He has spent a good chunk of his tenure defending a compensation package so embarrassingly large that the national media was obsessed with it for months. That was after a series of arguably bad business decisions and lots of downsizing.

Allen's heir apparent, AT&T President John Walters, resigned recently after he was told he lacked "intellectual leadership." But the snub came with a $3.8 million consolation prize. That was on top of a total of $27 million he received for just leaving his previous post nine months ago. Not too shabby for someone considered not smart enough.

When a company is struggling, sales are slumping and the stock is careening, you shouldn't be drenching the upper echelon in bonuses, stock options and raises. Rewarding people who clearly aren't performing definitely kills morale and certainly doesn't demonstrate much fiscal restraint to shareholders.

If a company is in trouble and there is pain to be endured, it should be a shared exercise. Before we show mediocre business leaders the money, they should show employees and shareholders the results.

Patricia Keefe, *News editor*
Internet: *patricia_keefe@cw.com*

People's frustration with their computers has resulted in a man firing several rounds into his computer today...
WAY TO GO!!
SETTLE DOWN, KACZYNSKI.
Prison Day Room
RICH
ComputerWorld

LETTERS

The art of good leadership key to high-tech success

IN "FATAL ATTRACTION: The dangers of too much technology." (*Computerworld* Leadership Series, June 16), Clayton M. Christensen offers overly simplistic prescriptions for high-tech marketing. Suggesting a "danger" in best practices such as listening to customers is nonsense. There are no easy prescriptions for analyzing market opportunity.

Success in today's high-tech market requires an adroit entrepreneurial form of leadership that is probably more art then science. Each leader must master the difficult challenge of reading a market that has many customer constituencies.

A close inspection of many companies reveals that they missed their opportunities because of a certain entrepreneurial ineptitude.

Most of these firms have a more complicated corporate illness that can't be fixed by merely suggesting, "Listen to your average user, and be wary of your power users."

Steve Edens
NetSail Internet Commerce
Charlotte, N.C.
sjedens@netsail.net

Crisis management issue greater than article states

I ENJOYED YOUR article on crisis management systems ("Red alert," CW, July 7). Few have been willing to admit that this is an issue the nation should address. Yet you may have understated the problem.

When the Bell system was dismembered, the major national resource coordination capabilities of AT&T were also, to a large degree, disconnected. As the long-distance market and, to a lesser degree, the exchange services market become more competitive, financial support of crisis management systems becomes difficult to justify.

That will only be exacerbated by the replacement of experienced telecommunications management by a more financially oriented focus within all those companies.

The one bright spot is that competition is increasing in network diversity and capacity — to the point where the only step required to have an excellent crisis management capability may be to implement a mechanism that permits the technical staff of competitors to work together toward mutual service restoration.

Bob Oenning
Washington

One solution to junk E-mail

I HAVE ONE potential solution to the problem of junk E-mail. Make junk E-mailers identify that their E-mail is unsolicited, perhaps with an identifier in the title of the message.

The system could then be set up to block any incoming messages that have that identifier.

This is half of a possible solution. The other half would be to have law enforcement investigate any potential scams, and nail those people who are perpetrating the scams.

A little fear of actually being caught might cut down on some of the scams.

Robert Lent
Software engineer
Bloomington, Minn.

Need for date-processing capabilities in office suites

I ENJOYED Chris DeVoney's review ("Head-to-head: Office vs. SmartSuite," CW, June 9), but I found it surprising that he failed to examine and compare the date-related processing capabilities of [the reviewed] suites.

> The year 2000 problem is alive and well on the desk top

The year 2000 problem is alive and well on the desktop, and users and information technology professionals alike should be told about it.

For example, what about passing dates between versions of suite applications (such as Excel 95 to Excel 97)? Should we expect less of a software product released in 1997?

I think you will be surprised if you look at the date-processing capabilities of the suites when you revisit this issue later this year. I hope you will do so.

Leon Kappelman
Co-chairman,
SIM Year 2000 Working Group
Denton, Texas
kapp@unt.edu

Computerworld welcomes comments from its readers. Letters shouldn't exceed 200 words and should be addressed to Maryfran Johnson, Executive Editor, Computerworld, PO Box 9171, 500 Old Connecticut Path, Framingham, Mass. 01701. Fax number: (508) 875-8931; Internet: letters@cw.com. Please include an address and phone number for verification.

FROM THE EDITORS OF

COMPUTERWORLD

VOLUME 2, NUMBER 6

JULY 28, 1997

Intranets

A MONTHLY LOOK AT WEB DEVELOPMENTS BEHIND THE FIREWALL

VERTICAL INDUSTRIES: PART 1

Intra-Verts

Companies in many industries are including intranets in their strategic plans. Here's what they have to offer healthcare, manufacturing and utilities firms.

So your company's been acquired and now you get to figure out how to make all the systems work together. Or you're having a little version control problem with people losing paper documents — or changing their copy and forgetting to tell everyone else. Maybe you're looking for efficiencies: databases that keep customer reps up to date and employees abreast of the latest crisis.

If you're in healthcare, manufacturing or electric utilities, you may have found what you're looking for: intranets.

And if you're in another industry, you can learn from the experiences of companies in these businesses: Many are grappling with the common issues of bridging disparate systems and improving access to data in a changing world. If your industry hasn't been rife with mergers, perhaps it's adapting to new government regulations. Or facing the need for huge cost savings in response to an increasingly competitive market. Perhaps your industry is in search of technologies to pave its future path.

Organizations we talked to secured unique benefits as well as common ones. Manufacturers can ensure everyone uses the same blueprint; factory workers receive timely quality control feedback; utility workers can stay abreast of storms and outages; and doctors can access patient records quickly online.

So read on — and tune in next month, when we'll feature three other industries and what intranets have done for them.

INSIDE ▪ MANUFACTURING, PAGE 2 ▪ HEALTHCARE, PAGE 4 ▪ INSIDE

CAD/CAM a Good First Step

Putting blueprints on the intranet is an idea whose time has come. Is controlling the factory floor next?

BY MARK BAVEN

Rotex, Inc. makes gyratory screeners — machines other companies use to separate their steel or coal into different sizes. All the screeners are custom-made, which means each needs its own blueprint. And lots of departments, from sales reps to engineers to the production floor, see those documents. Along the way, revisions are made. Different people were liable to end up with different versions. That is, as long as the process was paper-based.

But now, using various kinds of software and an intranet, everyone can work from the same set of blueprints. For manufacturing, that is quite a boon. "The intranet is used to facilitate exchange of design data among different groups, not just engineering," notes Erik Keller, an analyst at Gartner Group, Inc. "In the past, this was always too hard or expensive or both. But this technology makes it easy. People can go into the Web site and look up the latest version of a product."

Welcome to manufacturing in the 1990s, where automation, efficiencies and, increasingly, communications are setting the path for the future. And intranets are considered a principal strategic asset. Of the 125 manufacturers recently surveyed by Boston consultancy Advanced Manufacturing Research, Inc., 65% said they have built a corporate intranet. An additional 28% said they would have an intranet up and running within the next year.

Like other industries, manufacturing cut its intranet teeth on Web-enabled publications and human resources information, and industry-specific applications have been quick to follow. In manufacturing, that means putting computer-aided design/manufacturing (CAD/CAM) designs and applications where employees at all stages of the process can view and even amend them, improving efficiency and ensuring that everyone is looking at the same version of the plan.

Rotex in Cincinnati uses First CAD/CAM's Unix-based Grafteck package to create primary drawings, according to programmer/analyst Bill Bezemek and engineer Andy Herzog. Then Kamel Software, Inc.'s FastLook drawing viewer converts the drawings for display on any PC. "There were always problems making sure the production floor had current drawings. So our major goal [with the intranet] was to give production access to those," Bezemek notes.

Other companies are finding it worthwhile to put other processes on the intranet as well. At Parker Hannifin Compumotor, a maker of circuit boards for robotic motion control systems, intranet applications provide workers on the factory floor with immediate feedback on defects. Information on product assembly, cost accounting and even product ordering are either on the intranet or in the works, according to David Krauthamer, information systems manager (see related story at right).

If there's a downside to incorporating this technology that fosters collaboration and communication, it may just be that greater efficiencies raise the specter of layoffs. But at the same time, the jobs that remain may be more fulfilling, as hierarchical boundaries erode and intraorganizational communication evolves.

And there is plenty of room for intranet growth in this industry, with the labyrinthine supply chains and arrays of information and industrial technologies it uses. Consider extranets, where companies give suppliers and distributors protected access to their intranets. Or customer orders that, when placed on the company's Web page, initiate actual production on the factory floor. Or even online machine control.

But anything that involves real-time control and mission-critical applications may not find its home on the intranet for some time to come. "There's work to be done before intranets are viable for real-time manufacturing environments," notes Clay Ryder, a director at market research firm Zona Research in Redwood City, Calif. Still, with 93% of Advanced Manufacturing Research's survey respondents planning to have an intranet by next year, plenty of functions will be on a Web in the near future.

Baven is a freelance writer in Montague, Mass.

Compumotor Integrates Shop-Floor Data

"Automate or eliminate." That's the mandate at Parker Hannifin's Compumotor Division in Rohnert Park, Calif., a manufacturer of circuit boards used in robotic motion-control systems. So it might not be surprising to see the degree to which Compumotor's intranet integrates shop-floor data. David Krauthamer, the information systems manager with primary responsibility for deploying the company's intranet, summarizes some of its applications and benefits:

■ DEFECT REPORTS. This application has had the most immediate effect on real-time manufacturing processes. "Our SQL server has a front-end mechanism that captures and reports on manufacturing defects in process. This provides feedback to the floor, where they can respond to the problem immediately. It also helps us notice patterns and make remedial changes — real-time corrections. In the past, we'd generate all this info, and at the end of the month we'd do something about it. Now we can get the feedback loop as close to the person doing the work as possible."

■ STORYBOARDS AND VIDEOS are the materials that help workers learn and review complex and frequently shifting production processes. Now that the storyboards — mechanical step-by-steps that include schematics, tolerances and other technical specs — are online, managers can keep instructions and techniques current. Assemblers, who have access to PCs and workstations on the shop floor and elsewhere in the plant, can instantly answer their own questions or go through a whole fabrication process. They can also opt to view one of the online assembly videos.

■ ACTIVITY-BASED MANAGEMENT. This is a relatively new approach to cost accounting where all activities associated with a product are captured and quantified to measure how a company's resources are applied. On the intranet, workers throughout the company "bill" the time they expend on given tasks and do the same for the machines. "We're much better able now to tie labor to customers and products, and we have a more accurate sense of real cost structures."

■ EXTRANET. Compumotor is developing an extranet, primarily for use by its value-added resellers and suppliers for order management. Customers will use it to enter orders and check order status, product availability or returns. For suppliers, Compumotor will deploy material forecasts on the extranet, as well as performance statistics. Of course, this does raise security concerns. Even with RSA Data Security, Inc. encryption, Krauthamer says, "most IS managers are a little fearful about the extranet because there is [a chance of] a hole in the firewall. We've run Satan and Red Button, network probing tools, interrogation programs that work by initiating attack patterns and then look for phantom log-ins, probing registries."

■ TECHNOLOGY PREFERENCE. After some experimentation, Compumotor has opted primarily for Microsoft Corp.'s suite of intranet software, including SQL Server and Active Server. As an IS manager, Krauthamer says, he wants the seamless integration of a comprehensive line because that frees him and others at the company to devote more time to the applications themselves. "There are very real complexities, as you want to minimize problems where you can."

■ CUSTOMER SERVICE. For interrogating databases, Compumotor uses Microsoft's Web DB, a drill-down, enquiry-by-example tool. "This is great for lead tracking, sales, technical calls, problem resolution. We can buzz through half a million records in three seconds," Krauthamer says.

■ THE RIGHT TECHNICIANS/COMMUNICATORS. "We developed the expertise in-house for the 'net. For MIS, it's tough because the technology is so new, and so many different technologies are necessary. In terms of cultivating internal resources, I'd say get some strong computer science people who know the database languages, Web server technologies, etc. If anything, I would tend to err on the technical side. But people also need to be strong on presentation. So you might really need two people, unless you can find all these attributes in one."

— MARK BAVEN

"MOST IS MANAGERS are a little fearful about the extranet because there is [a chance of] a hole in the firewall."

DAVID KRAUTHAMER, IS MANAGER, PARKER HANNIFIN'S COMPUMOTOR DIVISION

ILLUSTRATIONS BY LARRY GOODE. PHOTOGRAPH BY CATHRYN MILLER

A Needed Shot in the Arm

Mergers and the changing healthcare model are forcing medical groups to make IT a priority. For many, intranets will show the way.

BY ANNE MCCRORY

Until recently, unconscious patients who were rushed to the emergency room at Beth Israel Deaconess Medical Center in Boston meant a scramble for medical records. What medications were they on? What was their history? Calls to the different records offices in the five-hospital network and computer searches led to random documents spilling out of the fax machine about a half-hour later. "Even then, [the information] potentially wouldn't be complete," notes Dr. Donald Rucker, an emergency room physician and instructor of medicine at Harvard Medical School. Though Rucker can't recall fatal consequences from such partial information or delays, it wasn't uncommon for staffers to order tests that patients had already had, wasting time and money.

The medical center, formed just last fall from the merger of the Beth Israel, the Deaconess and three community hospitals, hopes it's found a way to streamline that process — a way that didn't involve the costly duplication of Beth Israel's 28,000-program MUMPS system or Deaconess' Sybase, Inc. clinical data repository. An intranet called CareWeb was to go into production this month. When a doctor requests info on a patient, the application will go out and search the legacy systems of the hospitals in the network and return a consolidated record of such data as medications, allergies and health problems as a web page. This might not include X-rays or other data that can be automated — yet — but it provides a critical start to bridging the clinical systems.

"I think it's a very clever solution to a huge problem," Rucker says.

Mergers, cost control and a new healthcare model known as a continuum of care that comprises the various services and practitioners that now make up cradle-to-grave health services, rather than the former hospital-centric model: These are the events conspiring to bring information technology to healthcare, which as an industry has been late to the high-tech party. "Typically, it's because only recently did the healthcare industry start treating integrated information as a business necessity," says Deborah Kohn, principal of Oak Systems Consulting in San Mateo, Calif., and a 20-year healthcare information systems veteran. With the advent of managed care — which brings together multiple entities that need to communicate and seeks to control costs through efficiency, volume discounts and holding practitioners accountable for dollars spent — the industry "started realizing that information was an asset and that it had to be integrated."

Intranets are widely seen as one affordable way to make that happen in healthcare, as in so many other industries. Comprehensive intranets with patient records, resources for doctors, billing data and supply contract workflow are hardly ubiquitous, but plenty of projects are on the boards. In a survey of 1,200 attendees at the Healthcare Information and Management Systems Society (HIMMS) conference earlier this year, just 6% reported having a fully developed, widely accessible intranet in place. But 14% had some kind of intranet, 28% had a project in pilot and 37% more had plans for one. In an Ernst & Young study, "The Role of the Internet in Healthcare," 52% of respondents said using Internet technology was their top priority this year.

The studies show other priorities as well: 51% of HIMMS study respondents said infrastructure upgrades were among their Top 2 priorities for this past year, and just 12% cited intranets, though intranets can arguably be part of the solution for any problem. For instance, any of the top-scoring survey responses on the types of clinical information needed — comparative outcomes data, automated patient records and decision-support capability for caregivers — could be intranet-based.

Many types of projects have found a home on intranets. Baylor Healthcare System in Dallas, a consortium of seven hospitals, uses an intranet for a workflow application that routes pharmaceutical contracts among the various parties in the negotiations process, saving a projected $120,000 a year by eliminating monthly meetings that some executives had to travel to. The radiology

Continued on page 6

WHAT'S ONLINE

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HP DOMAIN

HEWLETT PACKARD

Continued from page 4

department at the University of Pennsylvania Health System will be filmless by the end of the year, with all X-rays as digital images that are loaded into the system as GIFs and JPEGs, says Reuben Mezrich, interim chairman of the radiology department. Partners Healthcare, a consortium of Brigham & Women's Hospital, Massachusetts General Hospital and other practices in Boston, has fashioned an information network where clinicians can find resources and look up colleagues among other intranet-based systems.

Yet not every project is without complications. Group Health Northwest, part of Group Health Cooperative of Puget Sound, is a health maintenance organization that wanted to give doctor's offices access to electronic files that contain business information as well as lab and X-ray reports and drug history. But the project, which was to use a secure extranet connection, hit a snag at the pilot stage due to disagreements over who was going to pay for building the backbone — the carrier or the doctors, says Sue Merk, Group Health Northwest's chief information officer. (US West declined to comment other than to say the project was a technology trial that's still on the books.) Merk says the project is now proceeding with other connectivity, such as modem and frame relay.

"PEOPLE KNOW THAT if they look up information inappropriately, they can lose their job."

DR. JOHN HALAMKA, CAREWEB ARCHITECT

SECURITY A CONCERN

One concern all the projects — and practitioners everywhere — share is security. A whopping 90% of the Ernst & Young study respondents said it was the major reason they hadn't embraced Internet technologies. The HIMMS study, asking respondents what they considered the greatest threat, reported 43% feared internal snoopers vs. 17% who feared computer hackers. Group Health Northwest allows primary care physicians to see only their own patients, and an alarm goes off if an office looks up an abnormally high number of patients in a day.

Dr. John Halamka, the CareWeb architect as well as an ER doctor at Beth Israel Deaconess and an instructor in medicine, says if the RSA Data Security, Inc. 512-bit key encryption his system uses is good enough for the CIA, it's good enough for him — but just in case, he's used 12 other layers of security. These range from Security Dynamics Technologies, Inc.'s SecurID tokens with passcodes that change every 60 seconds to Netscape Communications Corp.'s Secure Sockets Layer. Plus, patients have the right to a printout of everyone who has accessed their information, obtained via audit trail, and a newly hired security officer will do network traffic studies and look for aberrations. "People know that if they look up information inappropriately, they can lose their job," he says.

Such a mandate everywhere might help assuage the public's concerns about the future — a far-reaching system that, working well, would mean the hospital you visit in Daytona, Fla., would know your allergies if you're carried in while on vacation or that hospital professionals worldwide would have sufficient information to target disease and curb epidemics.

"How do we mandate on a national level that we'll seriously sanction and prevent the violation" of patient information? Halamka asks. "There has to be an organizational backup to all technology." And with providers voting Web-enabled applications the most likely emerging technology they will adopt — 59% in the HIMMS study — that issue is likely to be one of many the industry grapples with.

McCrory is a managing editor in *Computerworld*'s Magazines Group.

How CareWeb Works

1. CAREGIVERS REQUEST information on a patient by browser.

2. A "CONSOLIDATOR" receives the user query via standard HTML forms and disperses it to multiple hospitals' servers as an HL7 request.

3. WHEN THE INFORMATION comes back, the consolidator decrypts it and melds all the pieces of it into a single Web page display.

4. INFORMATION INCLUDES medications, allergies, lists of health problems, doctors' notes and visit history.

PHOTOGRAPH BY SUSAN STEINKAMP

CIO
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AND OPERA
www.opente

The one truly open email and groupware solution has been staring you in the face for over two years.

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NETSCAPE

Intranets Surge at Power Cos.

They track usage. They report outages. They even bring you the weather.

BY MARK BAVEN

Utility companies have a well-deserved reputation as conservative adopters of technology, but deregulation — and the intranet — have changed all the rules.

Utilities, yanked into the real world of competitive business practices and intensifying demands for communication by the Energy Policy Act of 1992, which opens the playing field to competition in the energy sector for the first time, will now be forced to compete. That means they need to find ways to increase efficiencies, save costs and ensure quality customer service and response to outages. Each state will be making the shift in its own pace and manner, starting with California's Jan. 1, 1998, target date.

Enter intranets. At New Orleans-based Entergy Corp., whose region covers four states, a power quality monitoring application is being tested on the intranet. Real-time devices from Electrotek sit at various points on the transmission grid and report on the load.

In Orlando, Fla., staffers enter trouble complaints and updates into an outage reporting application on the intranet at the Orlando Utilities Commission. A weather site reports on upcoming storms. The electricity generation departments update power projections, usage history and other information.

The planning department at the Electric Utility Department in Austin, Texas, has handy access to amperage, wattage and voltage readings for all circuits and transmission lines. "For me, it's a major time-saver — easily hundreds of hours a year," says Ken Lastinger, operations systems support specialist.

Whether it's providing industry developments or the information employees need to do their jobs, intranets are already entrenched in the utilities sector. Utilities seem particularly interested in push technologies, too. These allow administrators to send information out to users and have it pop up on part of their screens. "We use PointCast Network internally," says Mike McClure, director of technology strategy at The Southern Co., a holding company for five subsidiaries that provide electricity.

Ronald G. Parks, manager of computer operations for the Orlando Utilities Commission, says he'd like a rolling news feature with continually updated material on the desktop. "Something like PointCast with an outage ticker," he says.

Yet mission-critical applications aren't likely to be found on a Web any time soon. Current Internet protocols were designed more for simplicity than for reliable transmission of info. "You can't wait for latency in a network when you have a high-voltage line that's fallen; the response must be in seconds, not minutes," says Clay Ryder, a director at Zona Research, Inc. in Redwood City, Calif.

Baven is a freelancer writer in Montague, Mass.

But Who's Counting?

Few utilities seem to have run detailed return on investment (ROI) analyses to justify their intranet investment. Here are some reasons they cite:

1. DON'T NEED ONE. No serious competitor can afford to be without an intranet for much longer.

2. AN HONEST ROI is well-nigh impossible to calculate. Virtually all business processes can be affected, and the results are unpredictable or even unmeasurable.

3. INTRANETS APPEAR to yield enormous cost savings in administration, paper and printing and so on almost right off the bat. But hidden costs — for faster network pipes, faster servers, network and systems management tools — may emerge only as time goes on and applications on the intranet grow more complex.

4. MOST COMPANIES have had relatively painless — and inexpensive — implementations. Compared with earlier, buggier and bumpier technologies such as client/server, setting up a reliable intranet is a ride on an open road. At least so far as anyone can tell at this early juncture.

COMMENTARY: UTILITIES

The Final Frontier of Industry Deregulation

BY DAVID CAIN

Impending electric industry restructuring represents the last great frontier of vertical industry deregulation. Utility businesses will have to be rewired from the traditional, vertically integrated enterprises they now are in order to compete and survive. Information, contracts and dollars will drive these new enterprises in the same way that generation, wires and electrons drive them at present. Winners in the emerging competitive business environment will be those utilities that adopt and strategically deploy intranet technologies. Why?

WHAT'S ONLINE

Future energy enterprises will be federations of regulated and unregulated business entities. A full service energy enterprise might include a retail company, service company, distribution company, transmission company and generation company. There are many possible variations and combinations of the above, but the essential point is that all of these entities have to be integrated into a supply chain that is essentially transparent to customers. The traditional mainframe and more contemporary client/server architectures are too constrained, centralized and rigid to serve these infrastructure needs and support the radical changes. The Internet was born and bred to support federated computing and communications among autonomous entities and can adapt to the changes. And it is for this principal reason intranets will be the infrastructure king of next-generation energy enterprises.

Successful energy enterprises will employ intranet models at the strategic level right from the start. The intranet will serve as the binder that relinks the disaggregated pieces of the legacy utility into a coherent, agile and responsive energy enterprise. This approach moves beyond the important but essentially tactical intranet deployments that progressive utilities are currently undertaking.

Utility business strategists understand that the competitive battle will be won or lost on how well their enterprise attracts and retains customers. This focus shift toward customers strongly suggests that initial intranet investments and deployments should start with marketing and the customer interface. These investments should be coordinated with extranet developments that electronically bond utilities with key customers and partners.

Subsequent intranet deployments would extend backwards and throughout the enterprise.

Such an intranet backplane, using sophisticated security software as the virtual "chinese wall," would serve all the business entities of the new energy enterprise.

Finally, utility strategists will also understand how intranets support insourcing, outsourcing, acquisitions and mergers. The key is acquiring and deploying an ensemble of powerful Internet-based electronic commerce technologies that allow the enterprise intranet and extranet to be functionally transparent.

Aggressive intranet deployments in restructured energy enterprises must be tempered with collateral risk management. Internet technologies are not as mature as alternatives, and there will be some utility reluctance to launch mission-critical intranet applications. But there are some risk management options.

Other industry verticals such as telecommunications and financial services are well ahead of electric utilities in using intranet technologies and dealing with deregulation. Not only is this experience base useful, but there is also a strong possibility that proven, industrial-strength applications can be imported from these other industries and adapted and deployed at minimal risk and modest expense.

Another risk management strategy is to seek partnerships with major vendors and consulting firms on the Internet scene. These are often of a very different breed of company that utilities have traditionally relied on to fulfill IT needs.

The intranet will serve as the binder that relinks the disaggregated pieces of the legacy utility into a coherent, agile and responsive energy enterprise.

Cain is manager of IS and telecom at The Electric Power Research Institute in Palo Alto, Calif.

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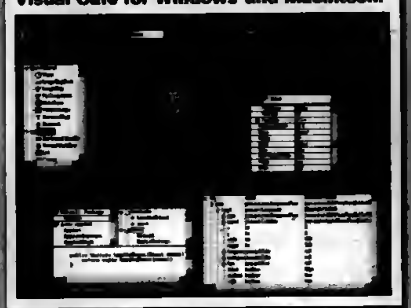

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N
NETSCAPE

Convergence? Just say no

Michael Cohn

I turn to you sages out there because trouble is brewing. We Americans have all the technology we need. We average nearly two PCs per household. We have TVs galore. We all have cellular telephones, microwave ovens and even a handful of blenders, although odds are one or two have been missing a lid since 1986.

But something horribly evil now threatens all this technobliss, and that's convergence — "converging" the technologies of the PC and TV into one Web-enabled, 500-channel, fight-over-the-remote appliance that infests bedrooms and dens across this great nation.

If you want a TV to act like a computer, it has to make you wait.

Ladies and gentleman, run from convergence. Run very fast. It's the worst thing to happen to American in-home entertainment since *Eight is Enough*. People understand PCs. They understand TVs. But make strange bedfellows of the two and you've got nothing but trouble. Because if you want convergence — if you want cable and computer, bauds and Bob Saget all on one device, then you'd better figure out what to do with:

THE REMOTE CONTROL

My advice: Get rid of it. I once had a TV remote. I once had a VCR remote. And I bet they'd work fine, if I knew where they were. But kids hide them. Sofas swallow them. My maid likely has several hundred stashed in her trunk.

But a mouse — now there's an invention. It's connected by a wire. Never gets lost. Never needs batteries. Never mysteriously disappears in the dryer, which actually once happened to my remote. (It might still be in there, if it hadn't changed channels like the dickens every time the dryer hit tumble dry.)

RESPONSE TIME

If you want a TV to seem like a computer, it has to act like a computer — it has to make you wait. No more instant response! You'll hit channel change, then wait. Hit volume, then wait. Maybe you'll miss a grope on *Melrose Place* or an amazing Dodger double play. But slow response time is the unwritten law of high-tech; don't fight it.

SECURITY

If we need to protect PCs, imagine trying to protect a PC/TV. Especially because it will be on 18 hours per day, sucking in signals from extranets, online businesses, the Web and Lord knows what else.

With so much data flying across cyberspace, who can protect my household from pornography, hackers, terrorism or fraud? Not to mention the episodes of *Seinfeld* that really rubbed me the wrong way?

GAMES

Not that there aren't enough PC games already. But soon you'll play real game shows, exactly as if you were there. No more $49 *Jeopardy* or *Wheel of Fortune* CD-ROMs quietly booting up in the privacy of your own home. You'll get to play the game online with thousands of you cyberneighbors, which may become somewhat embarrassing when you're staring at "THE STAT_E OF _IBERTY" and still need to buy a vowel.

VOICE

If convergence gets too far out of hand, your PC/TV won't even have a keyboard, it will be voice-activated. You'll be able to tell it to record programs. Send an E-mail. Delete a file. But along with this incredible verbal power, you'll also sadly discover that voice and convergence are a really bad combination. Especially the next time you crank the volume on some heavy rap video and the box goes completely berserk. □

Cohn is a computer consultant in Atlanta who still struggles just to get a clear picture on UHF.

Who needs quality? It got an award

Michael Schrage

Serving on a computer industry awards committee is one of those dubious honors that brings to mind Voltaire's bon mot about life's little experiments: Once a philosopher; twice a pervert.

The petty backbiting, favor-swapping, venal politicking, Machiavellian maneuvering and ego jousting in these groups rivals the jury deliberations of the O. J. Simpson trial — except, of course, that awards meetings typically take longer and do a better job of rationalizing their results.

Practically every newspaper and magazine in this industry — from *Computerworld* to *BYTE* to *CIO* — offers its own tokens to the people and products they cover. The computer media market their slew of annual awards even more aggressively than they market their features. Mark my words: As webzines flourish, we will soon see a new generation of cybercelebration and self-congratulation. No doubt, we'll eventually have restricted Academy Award-type voting with only those digerati with fashionable domain names permitted to click their mice on the icons of the worthy. (No *@aol.coms* or *@compuserve.coms* allowed here!)

Only Hollywood rivals this industry's primal lust for awards. Might it be because — despite our best marketing initiatives — there seems to be absolutely no earthly correlation between quantity of effort, quality of product and tangible results?

THE AWARDS INSTINCT

There is something undeniably sociobiological in this human craving to create and observe awards-giving rituals. This grotesque need to gather together around mediocre food to hand out symbolic bits of matter and congratulate and commiserate seems hardwired into our DNA. But it's fair to observe that this industry — let alone Hollywood — would lose its ability to make some sort of sense of itself if it gave up giving awards to itself. Perhaps we make up for the capriciousness of our marketplace by the capriciousness of the awards we give.

In the absence of genuine market success, a nice Editor's Choice can soothe the agonies of failed betas and briefly ward off the equity imprecations of impatient venture capitalists. The pathology of prize-giving in this industry practically screams for ruthless parody.

So, much as people enjoy speculating who should play whom if Hollywood ever turned the DigiBiz into a movie (James Woods as Larry Ellison? The late Sydney Greenstreet as Lou Gerstner? The young Peter Lorre as Bill Gates?), coming up with new awards for the digerati is an out-of-the-closet hobby in which practically everyone in the field indulges. Creating a promotable new awards concept is the dream of every mind share conscious marketeer, flak and editor.

In the absence of market success, an Editor's Choice can stall impatient investors.

The obvious suggestion is to ratchet up this whole awards thing to another level. What this industry truly lacks is — yes! — an Award for The Best Award. Think meta. In fact, let's call it The Meta!

Think of the possible categories: "Most Influential," "Most Creative," "Most Unpredictable." The idea that organizers could win an award for creating the best award might spur significantly greater innovation in the field instead of this god-awful glut of media and professional organizations handing out kudos for something a bunch of folks voted on during a 48-hour retreat at the Motel 6 in Belmont.

Precisely because our awards subculture is so important to the way we critique ourselves, we need a prize scheme that makes the awards-givers a little more self-conscious instead of merely self-congratulatory. Any nominees? □

Schrage is a research associate at the MIT Media Lab and author of No More Teams! *His Internet address is schrage@media.*

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COMMENTARY

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DAVID MOSCHELLA

WITH THE imminent availability of Microsoft's Internet Explorer 4.0, corporate customers must once again decide whether to use Microsoft or Netscape as their window to the Internet. In most cases, there isn't much point in using both.

I'll let others debate the technical merits. Let's assume for now that the business value of both Explorer and Communicator is roughly equal. To me, the issue then becomes primarily a philosophical and moral one. Do you think it's fair for one very rich company to give away a product for the sole purpose of hurting a far less rich competitor? If you don't think it's fair, should this affect your purchasing decisions?

Notice that I've used the word "fair," not "legal." The U.S. Department of Justice may well determine that Microsoft isn't doing anything illegal. Personally, I don't see how. But even if Justice demurs, there are many things that are legal but still unseemly, especially on the Internet. This isn't meant to vilify Microsoft or glorify Netscape; both are behaving much as their stockholders would wish. The question is how you should react.

FREEWARE BATTLE

The argument that Internet freeware is a fact of life is shallow. Netscape and others have used freeware, usually temporarily, for promotional and competitive purposes. But they haven't been able to permanently subsidize it with unlimited wealth from other monopolistic businesses.

Additionally, Microsoft isn't exactly a freeware-oriented company. Is there any doubt that its sole reason for giving away Explorer is to harm its one serious desktop software rival?

If you believe that business is basically a form of warfare, and therefore all is fair, then fine. Perhaps you should stop reading here. But if Microsoft's tactics run against your own sense of competitive fairness, what should you do?

KEEPING VALUES

Perhaps you feel you owe it to your employer not to pay for a product that you can get for free. But are you sure your organization wouldn't respect your professional judgment on this type of issue? And even if it wouldn't, professional standards often require resisting what purely business interests might dictate. This is especially true in our industry. For example, Internet values against spamming and in support of privacy often extend far beyond merely legal and financial concerns.

One could, of course, choose Communicator based solely upon self-interest. Supporting Netscape might help sustain software competition, and this competition might eventually yield benefits sufficient to justify today's investment. But however desirable, this long-term economic calculation is the easy way out. It deftly avoids the need to come to grips with Microsoft's predatory behavior.

In recent months, *Computerworld* has placed a major focus on IT leadership. A big part of leadership is earning the respect of others by doing what's right. If you agree that Microsoft's browser pricing is fundamentally predatory — and that predatory pricing is wrong — you shouldn't support it. How would you feel if someone were doing this to you? □

Moschella is senior vice president of research at Computerworld, Inc. His Internet address is david_moschella@cw.com.

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Get SI Right - Or Build an Ark

John Singel, Global Information Technology Leader at Price Waterhouse, shared key points of *Successful Systems Integration: The Seven Deadly Sins* with attendees of the 1997 SIM-ETS conference, here synopsized.

Successful systems integration takes hard-nosed managing of all the day-to-day details. And, from the start, proper conception. Even a well executed project will fail if it's a *mission impossible* assignment.

Surprisingly, a systems integrator may try to do something that's never been done before, without being entirely sure it *can* be done — and *still plan on a fixed timeframe and budget!* A recipe for disaster, but all too common in the push for competitive advantage through the implementation of technology.

Today's integration projects with eight and nine-digit contracts involve broader scope, both functionally and geographically. And a bewildering array of *choices*, from hardware, package software, custom built applications, middleware, and operating systems to third-party contractors, including integrators and outsourcers.

Will IS professionals understand the business requirements? Will the business side understand the technology issues? With growing reliance on outside specialists, who do you choose? Who can you trust? How should you tackle a large SI project? What points are critical to successful implementation? What are the danger zones?

Any solution combines components from many third-parties. The right one juggles factors like risk and systems management issues, limited time, internal resources, and ROI concerns. It meets the shifting expectations of end-users and management. Offers an architectural platform that supports the business strategy — and avoids boxing in the company with dead-end technology and solutions. A very complex business!

In 30 years of systems integration work, Price Waterhouse finds there are several common hazards which all SI projects must overcome. We call these The Seven Deadly Sins.

Delusionary Scope

Evils

Mission Impossible Projects
Has the proposed solution been done before? Or is it unproven? What looks good on paper may turn out to be impossible. And working within a set time and budget leaves no latitude to be creative.

Scope Creep
The project is well thought out at inception. Then, the inevitable stream of bright ideas begin. "Just one more thing" becomes hundreds, and scope doubles or triples.

Take calculated risks. That is quite different from being rash.

- General George Patton

Commandments

Propose Realistic Solutions
Consider both time frame and cost. Begin with a phase zero effort. The system integrator investigates the problem, develops an architecture, and develops a statement of work that begins to make sense in the context of what the organization wants to accomplish. If the solution lacks real business impact at this point, you've found out without spending the budget.

Business Unit (BU) Ownership
The executives of the BU which will derive the benefits from the project must (a) actively sponsor the project and (b) be accountable for its success.

Incentive Alignment
IT executives and BU executives should have their incentive compensation tied to project success. Staff working on the project must have a strong incentive to see it through. Link career success to the outcome.

Reality Checks
"Benchmark" the project scope, estimates and technologies against real projects which have actually been delivered.

Change Control
Well defined processes. Must be hard to affect a change.

Vapor Technology

Evils

Doesn't Work
Are you selecting your technology by what the brochure said it would do? Or working from the theory of what the hardware and software should do? Is it completely compatible with other pieces in the architecture?

Inadequate Performance
Technology either failed to meet specifications or was improperly scoped. Did the written specs overstate capabilities?

Unreliable
Frequent failure.

"Betting on the Come"
The next release will solve the problem.

You can't build a reputation on what you're GOING to do.

- Henry Ford

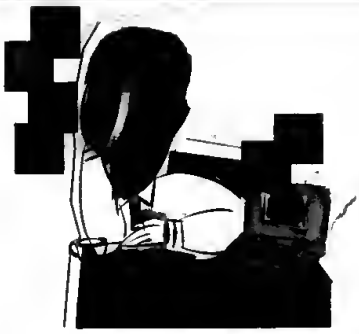
Commandments

Been There, Done That
Reality check: Has someone done this before and done it on the same scale? If it's been done before, you know what to expect. Make sure a hardware/software/infrastructure review is in place. Structure from foundation: What is the project designed to do? And is the technology cleanly aligned with business objectives and strategies? In choosing technology, analyze skill gaps. Be sure to provide adequate training for users and developers.

Test Early and Often
Validity checks, repeated validity checks. Prototyping and scaleability testing must be done. Prior to purchase, validate the way to integrate with existing architecture.

Architecture & Support Committee
Organize a group that clearly understands the existing architecture and can develop new. They must adhere to the plan. Also organize an internal support group, the first line of defense. Vendors offer the second.

Business Requirements First
Business requirements drive the technology, not the other way around.



Mis-Estimating

Evils

Takes Too Long
"One year" projects which take two years, or maybe three...

Costs Too Much
Not devoting the right people to develop the estimate. The best minds must develop a realistic approach or shortcuts and economies may pull the project off course.

Receding Goal Posts
"Just six more months." "Just another million dollars."

There cannot be a crisis next week. My schedule is already full.

- Henry Kissinger

Commandments

Independent Reviews
Solicit experiences and learn from people who have done similar projects. Past project teams can lend important knowledge. Also find or develop Subject Matter Experts — SMEs — with extensive topical knowledge (in addition to the established support group).

Project Planning
Use tools available in the marketplace. Need to plan to the level of the individual person's time. Even if you have enough total resources, do you have enough resources in the critical positions? People are not fungible!

Document Assumptions
Every estimate must have clearly listed assumptions and cut-off points.

Multiple Estimates
Use top down, bottom up and model-based estimates. Then compare. If there are big differences, you've missed something.

Project Mis-Management

Evils

Don't Know Where We Stand
Every program manager knows where they stand relative to the budget. But, where do you stand relative to the *work*?

Dates Continually Missed
Once, OK. Twice, OK. But where does it end? Before you know it, you're out of time and over budget.

Accordion Effect
Early dates are missed but end dates do not move. Ergo, middle dates get closer and closer together.

Idealism is fine, but as it approaches reality, the cost becomes prohibitive.

- William F. Buckley

Commandments

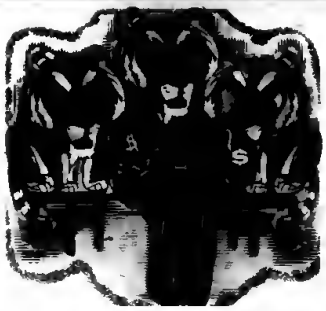
Project Office
Maintain an on-site location as the repository and central clearinghouse for all project information. Keep it updated.

Plan and Track to Sufficient Level of Detail
From experience, what are all the little things that need to be addressed? Plan them upfront and to the individual level. Track work and budget to be sure they're in sync.

Well Defined Deliverables
Spell out deliverables. Set deliverable dates and don't move the deadline!

Assign Project Manager
There is no substitute for experience. So hire a full-time, highly experienced project manager to hold accountable for deliverables. This person has a developed Change Control approach — a formal process for escalating issues.

Knowledge Sharing
Capture the project knowledge and share the information. Document the experiences and results. Develop an approach for Knowledge Management℠.



Third-Party Dependency

Evils

Can't Control Success of Project
Every large SI project depends on a host of third-parties — hardware and software vendors, the HR department, purchasing, legal, user(s), etc.

The price of greatness is responsibility.

- Winston Churchill

Commandments

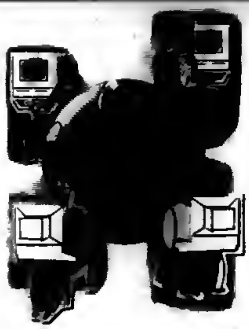
Have Skin In the Game
Do they have something to lose? As much as you? Make sure they do and have an incentive to meet project milestones.

Fall-Back Planning
Anything that can go wrong, will! So, have a detailed contingency plan in place. Budget for upgrade and life-cycle support.

"Fault Tolerant" Project Plans
If it has to be *perfect* to be useful, it will never be delivered. Build in error tolerances and know what they are.

Verify Their Credentials
Do you know contractors' track records? Are they financially stable? Check the company's references and individual resumes, reviewing each one, if possible.

Share Pain and Gain
Make sure they share in the risks and rewards. Make sure everyone knows who gives direction. Put them on the steering committee that meets regularly. Involve them early on in the planning, and make them party to the knowledge-sharing process. Make mentoring relationships a deliverable, addressed in agreement.



Mis-Matched Staffing

Evils

IS Staff Fails to Understand Business Problems
If previously left out of the meetings involving business requirements, staff are unlikely to understand the problems. They'll view the project through a different set of lenses, rather than in terms of business requirements first. Project team should represent a mix of functional and technical people, eliminating gaps.

Cannot Get Technology to Work
Is the technology new to staff? Do they lack hands-on experience? This is not the time to "bet the ranch" on inexperienced staff.

The point of the game is not how well the individual does, but whether the team wins.

- Bill Bradley.

Commandments

Been There, Done That
Put experienced managers in the lead and mentor the younger staff from the sidelines. Source staff from all possible areas — from within and outside. Solution may include educating existing staff. Plan lead time to hire, develop or source skilled people. Pair with external experts to develop needed skills.

Incentives
Providing incentives for achieved project objectives and milestones is imperative to a successful engagement. Penalties are counterproductive.

Depth Charting
Understand individual team members' places on the team, their skills and ability to fill and change positions when necessary. Have a backup for every position and be able to shuffle skills to meet every contingency.

Team Commitment
Conduct Real Team™ development sessions and get everyone 100 percent committed. Where appropriate, relocate staff to a central location.

Contract-itis

Evils

Finger Pointing
When contracts lack clear, concise information about the project, its parameters and measurements, the blame game begins. It happens when something goes wrong and no one understands who has accountability and responsibility.

Hostile Environment
When voices and arms are raised, the project is in real trouble. Once the finger-pointing starts, things digress. Negative feelings, surrounding the team or members of it, slow or stop progress.

Education is when you read the fine print. Experience is what you get if you don't.

- Pete Seeger

Commandments

Go For Win-Win
Understand and articulate each others' objectives for a successful project. Both sides need to feel they've contributed to and are being rewarded for their contributions. These then become business objectives and are written into the contract. Once the contract is written, it should never have to be looked at again.

Incentives, Not Penalties
If milestones are met earlier than planned, a reward is given. Knowing this will drive the team to deliver early.

Deal First, Legal Later
Involve the project team when defining contract scope. Determine the business requirements and articulate them clearly in writing. Then develop the legal aspects of the contracts terms and conditions.

Our main business is not to see what lies dimly in the distance, but to do what lies clearly at hand.

- Thomas Carlyle

The integrator's work? To weave the elements of a company's business strategy with its information architecture — the hardware, software, and network components of new and legacy systems — into a seamless path for information processing and retrieval. Blending electronic commerce and wireless computing to give customers and employees instant access worldwide. Using the latest technologies to enable business process transformation. And those are just the basics.

The real test of an integrator? Can it *design an integrated information strategy* — and then *deliver* it? A strategy that carries the company forward. And allows implementation process improvements at every step, regardless of competitive, economic, and industry issues. One that considers contingencies and leaves the company flexible, poised to compete. That's the ideal.

What's the biggest obstacle to achieving it? Often, the *company* itself! Management may hire a skilled integrator, but insist on dealing with vendors directly — isolating the creative forces that should work together. To see where technology is headed, where the business is headed, and how they best converge, the company must actively participate with and trust the integrator. And, have confidence in the relationship.

It must allow the integrator and vendors to collectively develop solutions and strategies devising the best answers from the best minds. Together, they develop a plan that lets everyone gain their objectives. When that happens, the project docks safely.

Price Waterhouse employs over 10,000 professionals worldwide to deliver enterprise-wide, multidimensional solutions to clients globally. It operates with a single, international management team and organizational structure. And, serves the largest, most prestigious companies around the world.

With a combined pool of talent, expertise, and resources, PW responds quickly, bringing together the right mix of skills, expertise, industry background, and cultural knowledge for specific client needs. A single set of tools, methodologies, and training ensures that service delivery is consistent worldwide, regardless of location.

Systems

The

Corporate Strategies

Case Studies • Trends • Outsourcing

Briefs

Point-and-click career service

▶ *Recruiting ware does more than track resumes*

By Julia King

ELECTRONIC resume tracking systems are nothing new to major corporations and even some large public universities with tens of thousands of students. But steep prices have kept them out of reach at many smaller organizations.

Not at Lafayette College in Easton, Pa.

There, career counselors have been able to justify an investment of about $100,000 in Lexington, Mass.-based Restrac, Inc.'s software by creating additional applications that extend the system's benefits well beyond graduating seniors in search of their first jobs.

MORE FOR THE MONEY

Additional uses include the following:

- Matching undergraduates to volunteer alumni mentors.
- Electronically tracking biannual career counseling appointments, which begin during a student's freshman year.
- Matching undergraduates to internship opportunities.

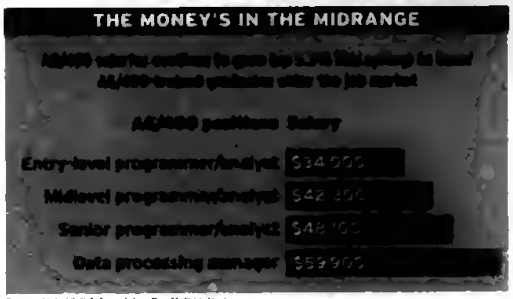
"Before, we had a manual file of students' resumes. Employers would call and ask for a particular background, and a recruitment coordinator with a wonderful memory would go through a file of resumes," said Deborah Jones, associate director of career services at the private liberal arts college.

"It was a hit-and-miss method," Jones said.

Now, Jones' office can quickly search its electronic database of more than 2,000 undergraduate resumes, plus those of graduates, to respond within hours

Resume tracking, page 40

IBM brings AS/400 basics to students


THE MONEY'S IN THE MIDRANGE
AS/400 salaries continue to grow as IBM shops vie to hire AS/400-trained graduates enter the job market
AS/400 positions Salary
Entry-level programmer/analyst $34,000
Mid-level programmer/analyst $42,000
Senior programmer/analyst $48,000
Data processing manager $59,000

Source: Nate Vlatt & Associates, Des Moines, Iowa

By Tim Ouellette

SOME OF the most in-demand information technology staff in the industry work on a system that some people — particularly college students — don't even know exists.

For the estimated 50,000 IBM AS/400 shops in the U.S., that has meant a lack of qualified AS/400 staff.

In fact, in some parts of the country, AS/400 programmers command higher salaries than their Unix counterparts (see chart).

To address the skills shortage, IBM is bringing AS/400 systems and training directly to college campuses around the country. The paradox IBM faces is that the AS/400 is an easy-to-use, general-purpose business machine. That's good, but it also means there are few students in

AS/400 skills, page 40

OUTSOURCING

Tasmania has a devil of a hiring problem

By Thomas Hoffman

THINK YOU'VE GOT problems finding talented technologists here? Try finding a network manager in Tasmania, the Australian island state near the bottom of the world.

Tasmania isn't a hotbed for tech skills

The IS labor crunch helped drive Trust Bank's decision to off-load its information systems operations to Hewlett-Packard Co. under a five-year, $16.5 million outsourcing deal late last year.

The core industries in Australia's smallest state are agriculture, mining and forestry.

Despite government efforts to promote high tech in "Tassie," as it is referred to by locals, finding and retaining skilled IS staffers here continues to be an

Tasmania, page 40

Program links disabled to jobs

▶ *Agency lowers barriers, has lesson for IS*

By Laura DiDio
DAMARISCOTTA, MAINE

THANKS TO Windows-based PCs and a computer bulletin board, Glenn, a 37-year-old mentally disabled man who uses a wheelchair, has a job as a data-entry clerk at his local Sounds Easy Video store.

Glenn is one of 35 mentally and physically disabled people who regularly participate in an innovative computer "habilitation" program run by Mobius, Inc., a nonprofit organization here.

The program is a model for methods that can be deployed by information systems managers to support and lower the barriers to entry for disabled workers within corporations.

REACHING OUT

"Computer hardware, software and online services are great equalizers in terms of providing competitive employment opportunities for the disabled," said David Lawlor, Mobius' executive director.

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Mobius, page 40

Mobius' Eric Epper (center) says PCs are a great equalizer for disabled clients such as Glenn James (left) and Robert Sutherland

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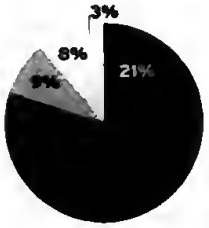
Federal government year 2000 systems status



- Already year 2000-compliant
- Being fixed
- Being replaced
- Being scrapped
- Haven't been evaluated

Source: Office of Management and Budget, Washington

Alberta/IBM pact

The government of Alberta, Canada, has hired IBM to develop a blueprint for a health information network for the province. The project is expected to be completed this fall. Terms of the agreement weren't disclosed.

HP recovery service

Hewlett-Packard Co. has introduced a set of business recovery services for Windows NT environments. The service includes delivery of replacement HP hardware and Intel Corp.-based servers within 24 hours of failure. The service costs about $300 per server per month.

Custom handbooks

KnowledgePoint in Petaluma, Calif., recently released Policies Now 5.0, employee handbook software for Windows NT and Windows 95 networks. Policies Now 5.0 lets businesses customize their employee handbooks to meet specific needs. The software includes more than 80 employment policy topics. Version 5.0 offers World Wide Web links to Internet sites that provide information on legal and policy issues. Users can publish the finished policies on a corporate intranet. It costs $129 for a single-user license.

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WITH DISTRIBUTED APPLICATIONS, A PROBLEM

IS ONLY A PROBLEM IF YOU DON'T

SEE IT COMING.

!Candle

Software does more than track resumes

CONTINUED FROM PAGE 37

to any of the more thao 10,000 job postings the college receives annually.

"I had one employer call me and give me key words to search, and I was able to immediately fax him three resumes based on that discussion," she said.

"I wouldn't be surprised in the future to see job postings come in as electronic mail, and resumes going out the same way," she added.

Manual resume searches were hit-and-miss

On the mentoring front, career counselors have used the Restrac system to link undergraduates undecided about a major with alumni with similar interests. "We can show them the English major who is now a medical doctor. This can help show students the linkages between majors and careers," Jones said.

Lafayette also has integrated the resume system with its World Wide Web home page. Employers can send the career services office job listings, which are then entered into the Restrac database (*www.lafayette.edu/careers/employers.html*).

Memorial Sloan-Kettering Cancer Center in New York, also a Restrac user, is among the employers that regularly transmit job opportunities to Lafayette, which Sloan-Kettering has targeted as a proven source of good candidates.

"We can create criteria for a search, then E-mail that to Lafayette, and Lafayette can apply it against their database and do the same kind of search we've constructed," said Edward Kleinert, a human resources information systems administrator. "In terms of processing a transaction, including posting a job, searching data and responding, it can become almost a real-time exercise," Kleinert said. "That's what is so compelling about this technology." The major payoff, he said, is time savings. Sloan-Kettering's average hiring time is 22 days, compared with 36 days for the health care industry as a whole, Kleinert said. □

Mobius program links disabled to jobs

CONTINUED FROM PAGE 37

for businesses to hire people with disabilities for "sheltered" jobs that grouped disabled workers together, affording little interaction with the rest of the workforce. Technology is changing that.

"We learned that moderate mental handicaps and wheelchairs are not obstacles to Internet access or exchanging E-mail," said Eric Eipper, Mobius' assistant day care coordinator, who runs the computer habilitation program.

SKILLS IMPROVED

The simple act of using a computer keyboard aids mentally retarded individuals — many of whom suffer from physical disabilities such as cerebral palsy and use wheelchairs — to hone their motor skills.

That's what happened to Wilma, a 43-year-old mentally disabled woman who is blind.

"Daily computer use developed her cognitive skills. We were amazed when she memorized the necessary keyboard and system commands to log on to online services, unaided," Lawlor said.

The voice-recognition and speech-navigation facilities in IBM's OS/2 Warp 4 operating system take Wilma's online efforts a step further by providing her with the means to independently log on to special interest bulletin boards and communicate unassisted with other disabled people.

In the year since its inception, Mobius' computer program has had a dramatic impact on the lives of Wilma, Glenn and other Mobius clients. For them, PCs have become eyes and ears — a lifeline to the outside world.

Before Glenn learned to use a PC, his duties at Sounds Easy Video consisted of "just dusting the shelves," Eipper said.

Then there is the case of Craig, a 23-year-old, nonverbal autistic man who was misdiagnoosed as severely mentally retarded. Once he learned to use the computer, he began communicating for the first time, tapping out messages on the keyboard.

It turns out he wasn't mentally retarded, only incapable of speech. "Now, Craig carries on daily conversations with myself and his other case manager," said Carolyn Holmes, a Mobius case worker.

When he isn't at his PC, he carries a Franklin handheld Spellchecker that lets him type sentences and communicate with others at the Mobius group home. Craig is currently job hunting. □

IBM reintroduces students to AS/400

CONTINUED FROM PAGE 37

college toying with the system the way they do with Unix and C++, for example. As a result, when AS/400 shops need to tune their systems to improve performance for a certain use, there are fewer bodies out there to get the job done.

Instead, users have to depend on an existing talent pool or fork out money to train someone on a completely new system.

"IBM has a huge problem facing it, because the AS/400 has no presence on the campus," said Nate Viall, president of Nate Viall & Associates, Inc., a consultancy in Des Moines, Iowa.

To change that, IBM will donate an AS/400 and software to colleges sponsored by a reseller or customer. By year's end, IBM will alter and package its current

IBM's problem: "The AS/400 has no presence on campus."

– Consultant Nate Viall

AS/400 training courses — aimed at businesspeople — to target college students.

For example, to get more AS/400 skills, Enterprise Rent-A-Car in St. Louis sponsored Jefferson College in Hillsboro, Mo., along with oumerous St. Louis-area high schools. IBM officials said there are 26 schools in such partnerships, the first of which was Georgia Southern University in Statesboro. There are also about 120 schools already with some sort of AS/400 curriculum, but users and IBM want to quickly double that.

That's because IBM's plans come at a crucial time, as AS/400 shops debate whether to off-load some of the box's duties to Windows NT or Unix servers.

"They should have been attacking the education market for the last 10 years or more to proactively create AS/400 skills," said Eli Sinyak, director of branch operations at Americao General Finance in Evansville, Ind. American General runs 1,400 AS/400s managed by five systems managers.

Although demand has always been strong for AS/400 staff, "it is just more pronounced lately because users are renewing their commitment to the technology," Sinyak said.

And with users planning to upgrade to the multi-CPU RISC AS/400s due later this year, there could be even more demand for high-end application tuning.

But at the same time, IBM's push to make the AS/400 a Java machine gives Java developers a way to program on the AS/400.

For example, Gartner Group, Inc. analyst Bruce Bond recommends that AS/400 shops stop programming in RPG, the box's traditional midrange programming language, in favor of newer methods such as Java. □

Tasmania has devil of time hiring for IS

CONTINUED FROM PAGE 37

uphill battle.

Unlike Melbourne and Sydoey, Tasmania isn't a hotbed for skilled technologists, said Stephen Pratt, general manager of electronic banking at the $1.6 billion Trust Bank. Trust Bank is a midsize bank in Hobart, Tasmania, with operations throughout Australia.

The IS skills shortage isn't just an American-made problem, it is a global epidemic, analysts said. It is difficult for firms "to find qualified people who know the local cultures and languages of their foreign business markets," said Lisa Maio Ross, an analyst at International Data Corp. in Framingham, Mass.

The technology labor crunch is leading more firms to outsource all or parts of their critical IS activities, she said.

Under the Trust Bank/HP agreement, HP will run daily computer operations at the bank's headquarters and its 41 branches throughout Australia.

HP will design a network infrastructure and will help implement a new retail banking system based on Oracle Corp. database software and a combination of Windows NT and Unix servers. Other services will include business recovery and software maintenance.

Trust Bank is in discussions with a set of unnamed vendors to take over its application development activities, Pratt said.

Trust Bank's 30-plus IS staffers will remain with the bank until the end of November, when the new banking platform goes live. After that, those employees will be let go, and HP will take over the bank's IS operations, Pratt said.

To keep staff productivity high in the interim, Trust Bank has guaranteed its IS staff six months' severance pay as long as they meet predefined performance levels. So far, the bank has run into problems with only two employees, who have since left voluntarily, Pratt said. "That's not to say it's all rosy [within the IS department], but we seem to be achieving the things we need to," he said.

Pratt said the decision to outsource was centered on gaining technological expertise and had less to do with cutting costs. HP already has brought a more "systematic" approach to managing the bank's network, "something we weren't able to do before" because of the bank's lack of expertise, Pratt said.

The bank wants HP to help it deliver Interoet-based transactions to its customers within the next year. Online banking is already offered by rivals such as Advanced Bank Australia Ltd. and Commonwealth Bank of Australia, both in Sydney. □

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Please complete the questions below.

1. BUSINESS/INDUSTRY (Circle one)
10. Manufacturer (other than computer)
20. Finance/Insurance/Real Estate
30. Medical/Law/Education
40. Wholesale/Retail/Trade
50. Business Service (except DP)
60. Government - State/Federal/Local
65. Communications Systems/Public Utilities/Transportation
70. Mining/Construction/Petroleum/ Refining/Agriculture
80. Manufacturer of Computers, Computer-Related Systems or Peripherals
85. Systems Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
90. Computer/Peripheral Dealer/Dist./ Retailer
95. Other_____ (Please Specify)

2. TITLE/FUNCTION (Circle one)
IS/MIS/DP MANAGEMENT
19. Chief Information Officer/Vice President/Asst. VP IS/MIS/DP Management
21. Dir./Mgr. MIS Services, Information Center
22. Dir./Mgr. Network Sys., Data/Tele. Comm., LAN Mgr./PC Mgr., Tech. Planning, Administrative Services
23. Dir./Mgr. Sys. Development, System Architecture
31. Programming Management, Software Developers
41. Engineering, Scientific, R&D, Tech Management
60. Sys. Integrators/VARs/Consulting Management

CORPORATE MANAGEMENT
11. President, Owner/Partner, General Mgr.
12. Vice President, Asst. Vice President
13. Treasurer, Controller, Financial Officer

DEPARTMENTAL MANAGEMENT
51. Sales & Mktg. Management
70. Medical, Legal, Accounting Mgt.

OTHER PROFESSIONAL MANAGEMENT
80. Information Centers/Libraries, Educators, Journalists, Students
90. Other Titled Personnel

3. Do you use, evaluate, specify, recommend, purchase: (Circle all that apply.)
Operating Systems
(a) Solaris (e) Mac OS
(b) Netware (f) Windows NT
(c) OS/2 (g) Windows
(d) Unix (h) NeXTstep
App. Development Products ❒ Yes ❒ No
Networking Products ❒ Yes ❒ No
Intranet Products ❒ Yes ❒ No

4. Which of the following products do you buy, specify, recommend or approve the purchase of? (Check all that apply.)
(a) ❒ Internet software
(b) ❒ Internet browsers
(c) ❒ Web authoring/development tools

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The Internet

Briefs

Get SET to secure transactions

▶ *Merchants try out standard for 'net sales*

By Mitch Wagner

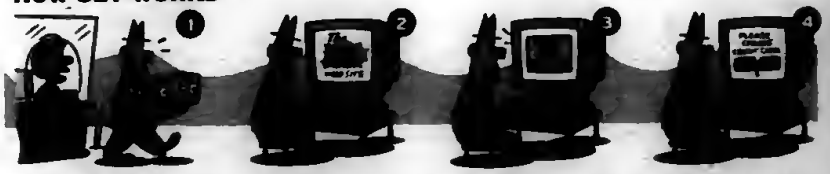
THE WRAPPING is as important as what's in the box for the handful of U.S. merchants testing a new method of securing financial transactions over the Internet.

Wal-Mart Stores, Inc., Alaska Airlines and sporting-goods merchant Cabela's, Inc. in recent weeks announced trials of the Secure Electronic Transaction (SET) protocol.

The technology, being developed by Visa International, Inc., MasterCard International, Inc., other major credit-card companies and hardware and software vendors, was designed to make it easier for buyers and sellers to

SET, page 44

HOW SET WORKS



A user acquires a digital certificate and digital wallet from his bank. The wallet and certificate tell the bank who the user is and what credit card he is using.

The user shops at a site, such as Wal-Mart. When he is asked how he wants to pay, the user selects SET.

Wal-Mart's servers send a signal over the Internet that invokes the user's SET wallet. It pops up on the user's screen.

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The acquirer approves or denies the transaction based on credit standing and passes that information over the Internet to Wal-Mart and back to the user's wallet.

The transaction is complete.

ILLUSTRATIONS BY DAVID COULSON

Vendors firm up to scale up Web sites

By Mitch Wagner

VENDORS ARE adding industrial-strength features to software that helps teams of programmers and content managers build large-scale World Wide Web sites.

Haht Software, Inc. in Raleigh, N.C., last week announced Version 3.0 of its Hahtsite Integrated Internet Development System. It supports distributed servers so applications can run simultaneously on multiple servers.

And Wallop Software, Inc. in Foster City, Calif., has shipped Version 2.0 of its Build-IT development software, with greater support for third-party development and version-control tools.

The packages are part of a small class of tools that help businesses create large, complex Web applications for the Internet and intranets. They were designed to let groups of software developers collaborate with content managers.

"We rolled out an intranet with the Haht software very fast, in a month-and-a-half development time," said Eric Garrison, manager of online services and systems administrator at Fleer/SkyBox International, Inc. in Mount Laurel, N.J.

The $150 million maker of sports trading cards uses the Haht software to maintain an online product database and an intranet for human resources.

The Haht and Wallop products allow for collaboration among technical staff and content developers and will let developers use a variety of third-party development tools and languages.

The Haht software will be available next month. Prices start at $4,995 for the server, $1,995 for a developer tool kit and $695 for a tool kit for business users. The Wallop software costs $2,495 per seat for technical users and $495 per seat for the business user tool kit. □

WEB REVIEW▶
Soft-drink marketing

Best sites quench thirst for content

By Frank Hayes

WORLD WIDE WEB sites that focus on consumer products seem to have the best of ideas — and the worst of ideas. That's especially true of soft-drink Web sites, which benefit from the same huge marketing budgets that sell billions of gallons of flavored sugar-water in the U.S. each year.

Soft-drink Web sites often are developed by advertising agencies and, not surprisingly, feature flashy graphics and well-focused messages.

But some of the ideas that make these sites striking are relatively easy to crib by information systems shops that are creating a marketing Web site or looking to dress up a Web-based application.

On the other hand, some major soft-drink Web sites are

Soft-drink sites, page 44

The Internet

Electronic Commerce • The World Wide Web • Intranets

Briefs

Keeping watch

Kanamen Corp. in Milpitas, Calif., recently upgraded its monitoring tool to better locate and block unproductive Internet surfing and to spot intranet bottlenecks. LittleBrother 1.5 can apply different access permissions by department. The Professional Edition can block Internet site access and support up to 1,000 users. Pricing for the Professional Edition starts at $495.

Address management

MetaInfo, Inc. in Seattle is shipping Meta IP, server software that manages IP addresses and eliminates the need to manually assign addresses and host names across IP networks. Meta IP costs $995.

Document delivery

Fabrik Communications, Inc. in San Francisco and Netdox, Inc. in Deerfield, Mich., are pairing up to offer secure document delivery services over the Internet. The service will let customers exchange encrypted documents and will verify the identity of the sender and receiver. Availability wasn't announced.

Speeding secure data

IBM has unveiled a cryptography accelerator card to help speed encrypted data over the Internet. The 4758 PCI Cryptographic Co-processor/Adapter is a one-slot add-in that supports the Secure Electronic Transaction protocol. Pricing wasn't available.

The most common time frame for Internet application development:

Midsize development group (11 to 100 developers) – One to three months

Large development group (101 to 500 developers) – Three to six months

Base: 289 development organizations

Source: Cutter Information Corp., Arlington, Mass.

Get SET to secure transactions

▸ *Merchants try out standard for 'net sales*

By Mitch Wagner

THE WRAPPING IS AS important as what's in the box for the handful of U.S. merchants testing a new method of securing financial transactions over the Internet.

Wal-Mart Stores, Inc., Alaska Airlines and sporting-goods merchant Cabela's, Inc. in recent weeks announced trials of the Secure Electronic Transaction (SET) protocol.

The technology, being developed by Visa International, Inc., MasterCard International, Inc., other major credit-card companies and hardware and software vendors, was designed to make it easier for buyers and sellers to

SET, page 44

HOW SET WORKS

1. A user acquires a digital certificate and digital wallet from his bank. The wallet and certificate tell the bank who the user is and what credit card he is using.
2. The user shops at a site, such as Wal-Mart. When he is asked how he wants to pay, the user selects SET.
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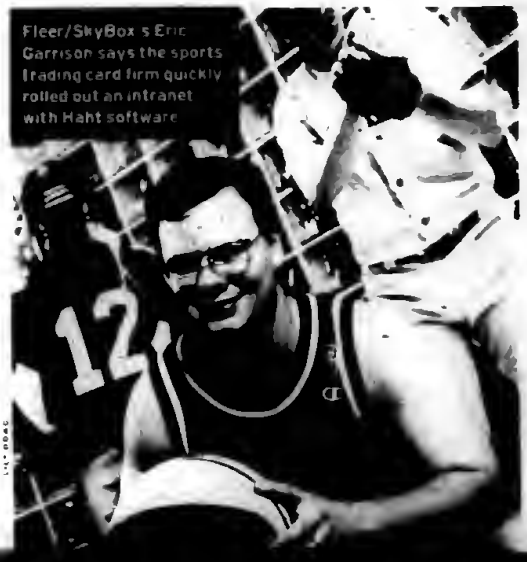

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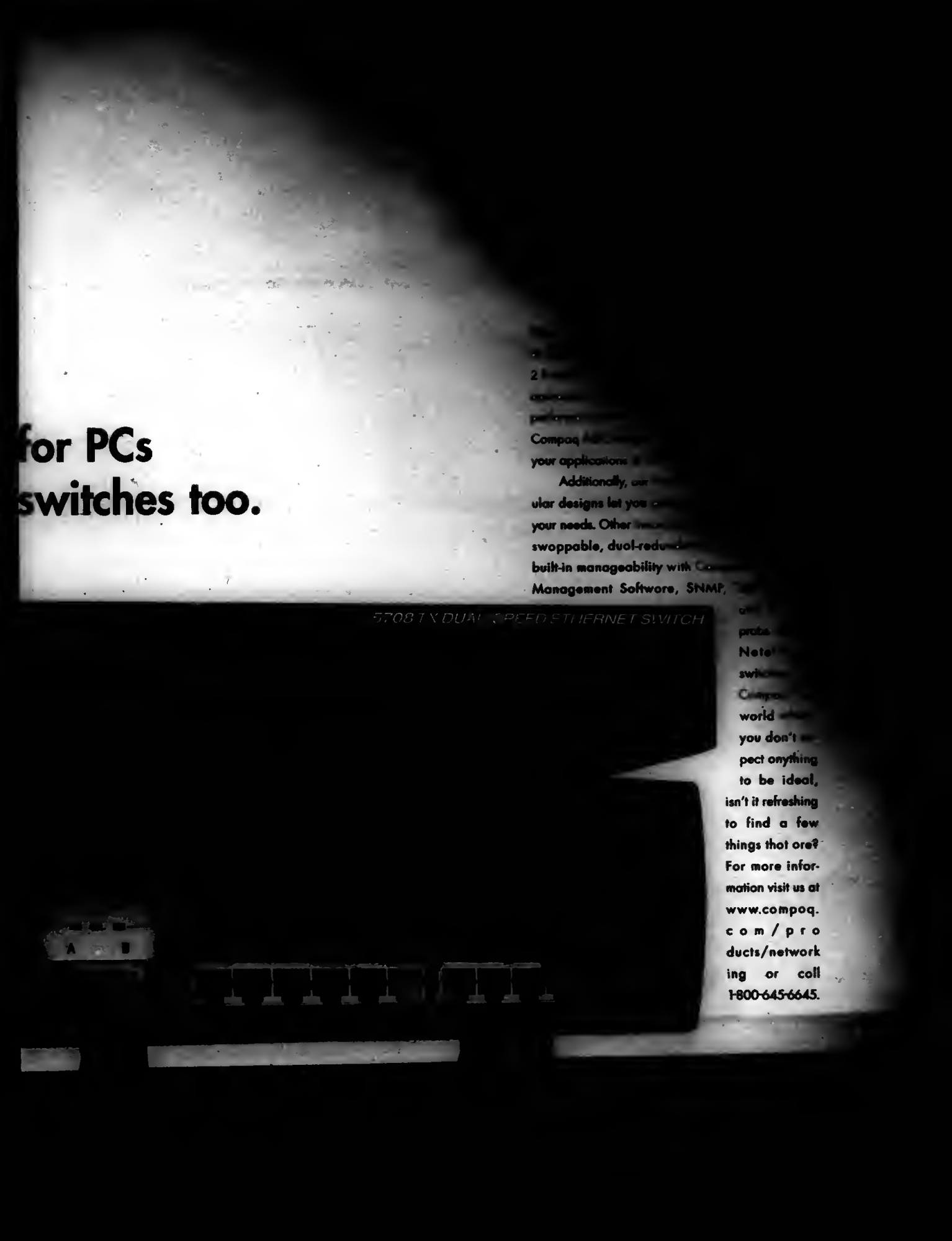
Soft-drink sites, page 44

In an ideal world, the company you trust
and servers would make
Welcome to an ideal world.


for PCs
switches too.
5708 TX DUAL SPEED ETHERNET SWITCH
A
B

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Extending a marketing campaign through the Web may be the wave of the future. But building a user-unfriendly Web site that offers nothing but that campaign will never be a good idea.

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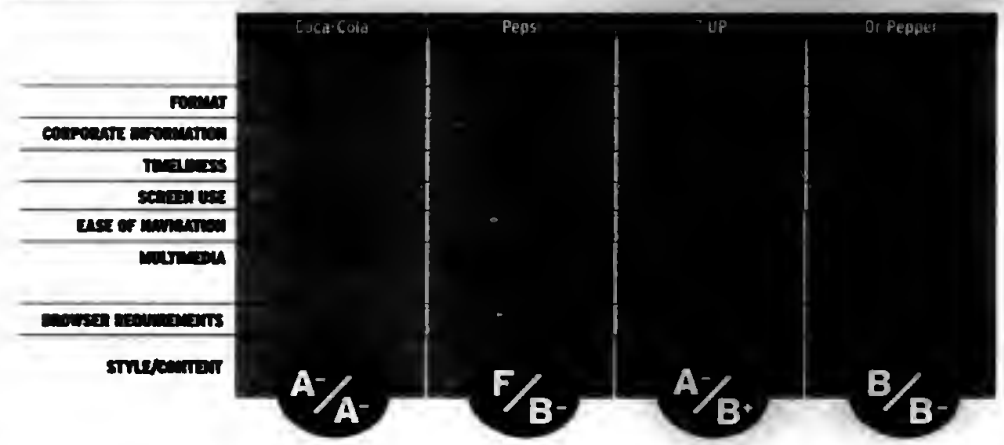
HOW THEY STACK UP



SET secures transactions

CONTINUED FROM PAGE 41

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The Enterprise Network

LANs • WANs • Network Management

Briefs

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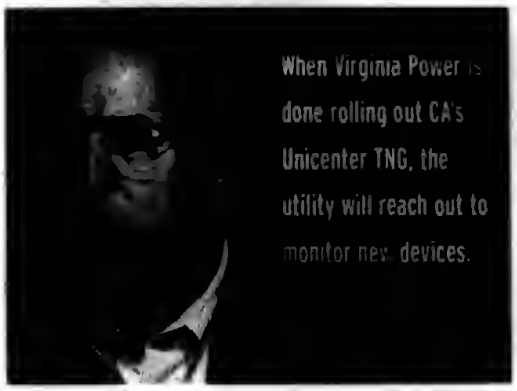
New uses for old tools

▶ *Users extend reach of end-to-end management*

By Patrick Dryden



END-TO-END management now involves more than responding to a jammed network, slow application or stressed server before the problem disrupts users' work.

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New uses, page 46

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Source: "Priest," security consultant

Employee participation key to successful security

By Sharon Machlis

IF YOU WANT management to view computer security as a useful business tool and not as an expensive annoyance, work with users and executives from Day 1 when drawing up plans and policies, a security specialist said.

"It's a shift in philosophy. Solicit information from users. Make them owners of the project," said the consultant, who went by the name "Priest" during a presentation at the Black Hat Briefing security and hackers conference this month in Las Vegas.

Before devising a security plan, systems specialists should meet and interview key users and managers to identify which critical data and systems to protect. "Find out what are your golden geese, your company jewels," Priest said.

CREATE A PLAN

Priest suggested exploring the following issues when devising a plan:

- What information is critical to the company?

Employee participation, page 47

WIRELESS HANDSETS

Sprint, Mobility Canada expand PCS coverage

By Kim Girard

SPRINT PCS in Kansas City, Mo., and Mobility Canada in Toronto recently joined forces to enable users to roam with a wireless handset throughout 56 U.S. cities and most of Canada.

Personal communications services (PCS) handsets can be used for voice, paging and, in some cases, electronic-mail traffic. PCS handsets can provide clearer voice quality and longer battery life than cellular units.

Sprint PCS is building an all-digital PCS network based on Code Division Multiple Access (CDMA) technology across the U.S.

Although Sprint provides very clear voice service, PCS service generally has spotty geographic coverage and poor support, analysts said.

"In 1997, PCS means 'pretty crummy service,'" said Bob Egan, an analyst at Gartner Group, Inc. in Stamford, Conn. Next year, it will mean "pretty

PCS coverage, page 46

Active Directory wait means extra work

By Barb Cole-Gomolski

WHILE USERS WAIT for Microsoft Corp. to ship its Active Directory in the first quarter of next year, they are doing a lot of custom programming to integrate their messaging directories. Or they are simply using Exchange's directory as a standalone name and address book.

Integrated directories from electronic-mail, operating systems and other applications present a single place from which to manage user information, thereby reducing administration time and costs.

The most common criticisms of the Exchange directory are that it is inflexible — difficult to set up and change — and it doesn't let users easily integrate information from other directories. Microsoft has yet to deliver a directory that both Windows NT and Exchange users can use, so Exchange sites must cobble their own systems to manage multiple directories. Exchange eventually will share Active Directory with Windows NT, making it simpler to integrate directory information across applications.

"We're not using the [information] in the Exchange directory outside of the mail system," said Ethan Winkley, LAN ad-

Active Directory, page 47

Source: Forrester Research, Inc., Cambridge, Mass.

WEB REVIEW▶

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FORMAT	Corporate site	Content site	Music webzine	Product site
CORPORATE INFORMATION	Yes	Alternate site	None	Some
TIMELINESS	Fair	Good	Fair	Fair
SCREEN USE	Good	Poor	Very good	Good
EASE OF NAVIGATION	Very good	Fair	Good	Good
MULTIMEDIA	Shockwave	Shockwave, QuickTime, VRML, RealAudio	RealAudio, Beatnik, Shockwave	None
BROWSER REQUIREMENTS	None	JavaScript, Frames	JavaScript, Frames	JavaScript
STYLE/CONTENT	A-/A-	F/B-	A-/B+	B/B-

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Remote access system

3Com Corp. in Santa Clara, Calif., has announced a remote access system for large corporate networks that need to support the growing legions of far-flung mobile users. The Total Control HiPer Access system can support 336 ports in a unit less than nine inches high. The product was developed by U.S. Robotics in Skokie, Ill., which recently merged with 3Com. A fully configured system, including dual redundant power supplies, will cost $525 to $550 per port when it is generally available next month.

MQSeries support

Tivoli Systems, Inc. in Austin, Texas, recently released a module for its TME 10 enterprise management framework that supports MQSeries messaging middleware from parent IBM. It allows managers to maintain MQSeries applications — and the supporting infrastructure of networks and systems — from deployment through monitoring and administration. Cost varies by configuration.

High-end routing

Start-up Torrent Networking Technologies in Landover, Md., is developing high-end routers designed for users rather than Internet service providers, as has been the strategy of industry giants such as Cisco Systems, Inc. The as-yet-unnamed super router is expected to ship in the fourth quarter. It will compete against a series of start-ups that have similar planned routers. Pricing isn't yet available.

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New uses for old tools

▶ *Users extend reach of end-to-end management*

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– Dennis Fishback, Virginia Power

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IF YOU WANT management to view computer security as a useful business tool and not as an expensive annoyance, work with users and executives from Day 1 when drawing up plans and policies, a security specialist said.

"It's a shift in philosophy. Solicit information from users. Make them owners of the project," said the consultant, who went by the name "Priest" during a presentation at the Black Hat Briefing security and hackers conference this month in Las Vegas.

Before devising a security plan, systems specialists should meet and interview key users and managers to identify which critical data and systems to protect. "Find out what are your golden geese, your company jewels," Priest said.

CREATE A PLAN

Priest suggested exploring the following issues when devising a plan:

■ What information is critical to the company?

Employee participation, page 47

WIRELESS HANDSETS

Sprint, Mobility Canada expand PCS coverage

By Kim Girard

SPRINT PCS in Kansas City, Mo., and Mobility Canada in Toronto recently joined forces to enable users to roam with a wireless handset throughout 56 U.S. cities and most of Canada.

Personal communications services (PCS) handsets can be used for voice, paging and, in some cases, electronic-mail traffic. PCS handsets can provide clearer voice quality and longer battery life than cellular units.

Sprint PCS is building an all-digital PCS network based on Code Division Multiple Access (CDMA) technology across the U.S.

Although Sprint provides very clear voice service, PCS service generally has spotty geographic coverage and poor support, analysts said.

"In 1997, PCS means 'pretty crummy service,'" said Bob Egan, an analyst at Gartner Group, Inc. in Stamford, Conn. Next year, it will mean "pretty

PCS coverage, page 46

Active Directory wait means extra work

By Barb Cole-Gomolski

WHILE USERS WAIT for Microsoft Corp. to ship its Active Directory in the first quarter of next year, they are doing a lot of custom programming to integrate their messaging directories. Or they are simply using Exchange's directory as a standalone name and address book.

Integrated directories from electronic-mail, operating systems and other applications present a single place from which to manage user information, thereby reducing administration time and costs.

The most common criticisms of the Exchange directory are that it is inflexible — difficult to set up and change — and it doesn't let users easily integrate information from other directories. Microsoft has yet to deliver a directory that both Windows NT and Exchange users can use, so Exchange sites must cobble their own systems to manage multiple directories. Exchange eventually will share Active Directory with Windows NT, making it simpler to integrate directory information across applications.

"We're not using the [information] in the Exchange directory outside of the mail system," said Ethan Winkley, a LAN ad-

Active Directory, page 47

How to bring order to directory chaos

- Resolve naming confusion by establishing a corporate standard for entries
- Reduce the number of physical directories
- Use a meta, or universal, directory to synchronize data stored in legacy directories

Source: Forrester Research Inc., Cambridge, Mass.

New uses for old tools

CONTINUED FROM PAGE 45

messaging middleware and to work with an existing help desk system.

When Shared Medical Systems Corp. (SMS) installs the client/server version of its health care applications at customer sites, it will use Unicenter TNG to minimize the expense of watching more than systems, software and network connections, said Larry McDermott, manager of remote management at SMS in Malvern, Pa.

At the nuts-and-bolts level, customer support staffers will monitor drive subsystems, uninterruptible power supply units and robotic tape handlers, McDermott said.

Those devices are "ordinary" because they can report via the Simple Network Management Protocol, he said, but SMS also wants to keep an eye on interfaces that gather data from medical monitoring devices.

Other Unicenter TNG users aren't so sure they can keep up with new management demands by themselves.

"We'll probably need outside help to develop agents to monitor our generating equipment, transmission systems and ultimately the meter at a customer's home or business," said Dennis Fishback, data processing manager at Virginia Power in Richmond, Va.

The utility is one-fourth of the way through its rollout of Unicenter TNG. When that rollout is done, Fishback said, he will reach out to monitor new devices.

CA's Unicenter TNG isn't the only enterprise manager capable of monitoring diverse devices at the far ends of a network. Many banks monitor automated teller machines, for example, with the Command Post event correlation tool from Boole & Babbage, Inc. in San Jose, Calif.

And vendors such as NCR Corp. are adapting specialized management applications to interact with enterprisewide platforms, including putting specific alerts from point-of-sale terminals into a format that is easy to read.

NCR's Windows-based sale systems report to an in-store Windows NT server, which holds alerts in the log file for easy access.

NCR's software can report to central enterprise managers such as CA's Unicenter TNG and TME 10 NetView from Tivoli Systems, Inc.□

PCS coverage

CONTINUED FROM PAGE 45

chaotic service," and service isn't expected to improve until 2000, he said.

Egan said Sprint leads the race for PCS geographic coverage, while rival AT&T Corp. offers a wider range of services.

Roaming service between Sprint PCS and Mobility Canada, a national wireless carrier that covers 94% of Canada, will be available by year's end when dual-band telephones are unveiled. The phones are necessary to use the service in Canada, which has a hybrid CDMA and analog cellular network.

Roaming fees for the service weren't announced, but Sprint officials said the dual-band phones cost $199. Current Sprint PCS customers pay a flat 50 cents per minute.

Other PCS leaders include Omnipoint Corp., US West, Inc. and Bell Atlantic Nynex Mobile.□

COMPUTERWORLD

For these and other related links, point your browser at www.computerworld.com/links/pcsjuly28links.html

PCS: The FAQs
www.uml.com/wireless-1/pcsfaq.htm

Understanding Cellular Technology
www.arcinc.com/AIS/phones/phones/cellterm/cellterm.html

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Active Directory wait means extra work

CONTINUED FROM PAGE 45

ministrator at Phelps Dodge Tyrone, Inc., a copper mining company in Phoenix that is moving about 8,000 users to Exchange.

The mining company uses Novell, Inc.'s Novell Directory Services (NDS) as its primary directory. The lack of integration between NDS and Exchange means the company has to manage two separate directories.

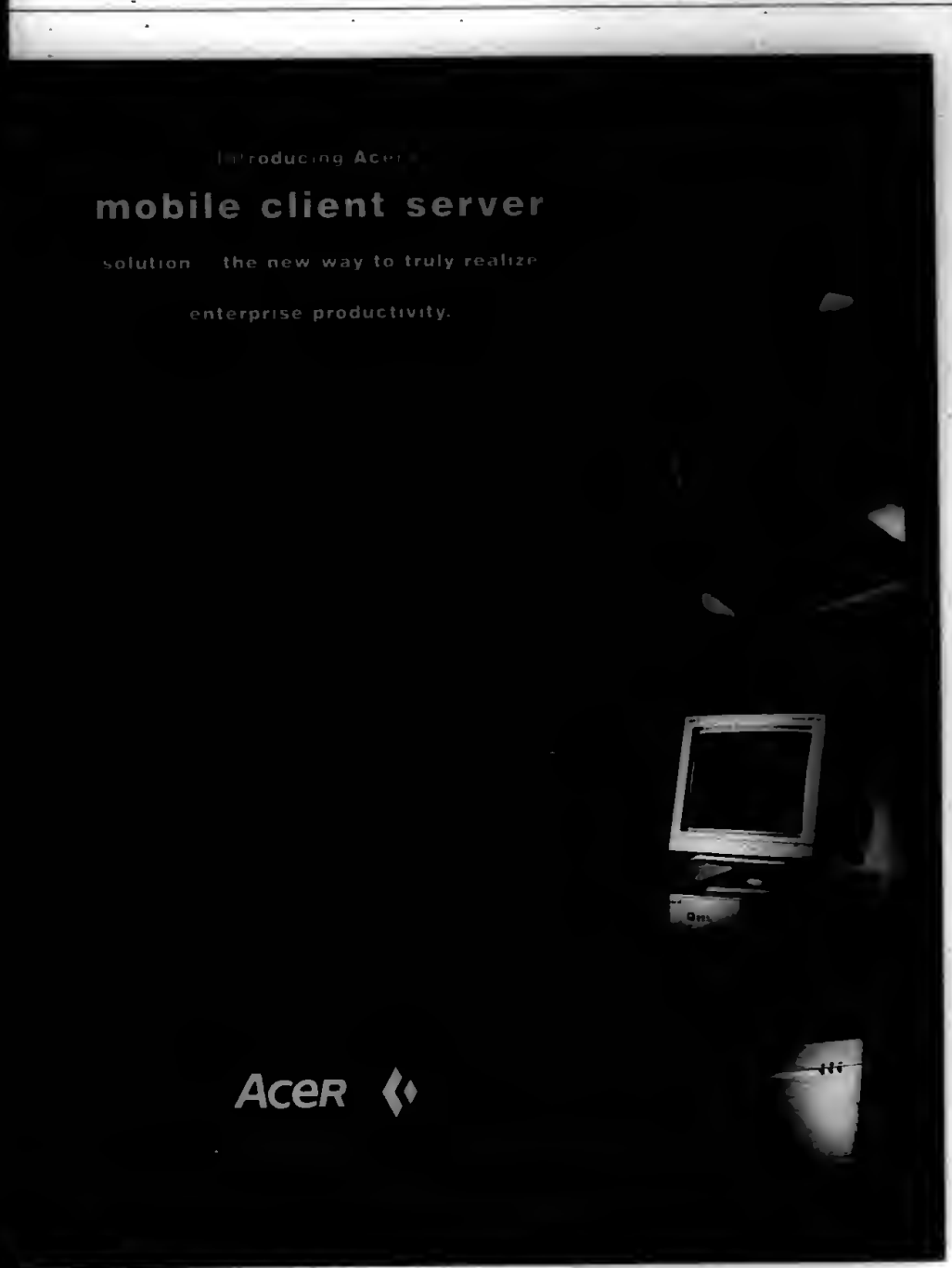
Lotus Development Corp. also is scrambling to deliver a directory within Domino that interoperates better with other offerings.

Support for the Lightweight Directory Access Protocol in Exchange, due by year's end, may help. But a single point of administration remains on hold until Active Directory ships.

Mike Roszkowski, a senior consultant at Creative Networks, Inc. in Palo Alto, Calif., said the directory issue is a growing concern for Exchange sites. "As the number of seats deployed goes up, [sites] start to feel the pain [of not having an integrated directory]," he said.

He added that the lack of a directory that can be easily integrated with corporate mainstays hasn't stopped sites from rolling out Exchange, but it has slowed them down.

An information technology director at a large food manufacturer that recently completed a large Exchange deployment said, "It slowed us down because we had to build a lot of our own [programs] to integrate information from other directories." Even with the additional work, he said it was still worth it to continue the rollout rather than wait for Active Directory to ship. □



Employee participation

CONTINUED FROM PAGE 45

- Who creates it?
- Who needs access to it?
- What would be the impact if that data were stolen, unavailable or corrupted?
- How long could the company operate without access to that data?

"You would be amazed at the number of responses [such as], 'Gee, we never really thought about that,'" Priest said.

> "You don't talk about Telnet or access control or encryption, but 'What can I do to help you do your job better?'"
> – Priest, a consultant

The information technology department can draw up a questionnaire for users and executives and then meet with them individually or at a group workshop, Priest said.

He recommended British Standard 7799, a government-backed industry-developed 10-point Code of Practice for Information Security Management, as a good starting point.

"You don't talk about Telnet or access control or encryption, but 'What can I do to help you do your job better?'" he said. After the goals of the project are nailed down, IT specialists can draw up specific policies and technical specifications.

It is all part of the philosophy of a successful IT department: "getting buy-in from upper management, moving IT from being a cost center to business partner," Priest said. □

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became the most famous computer on this planet.
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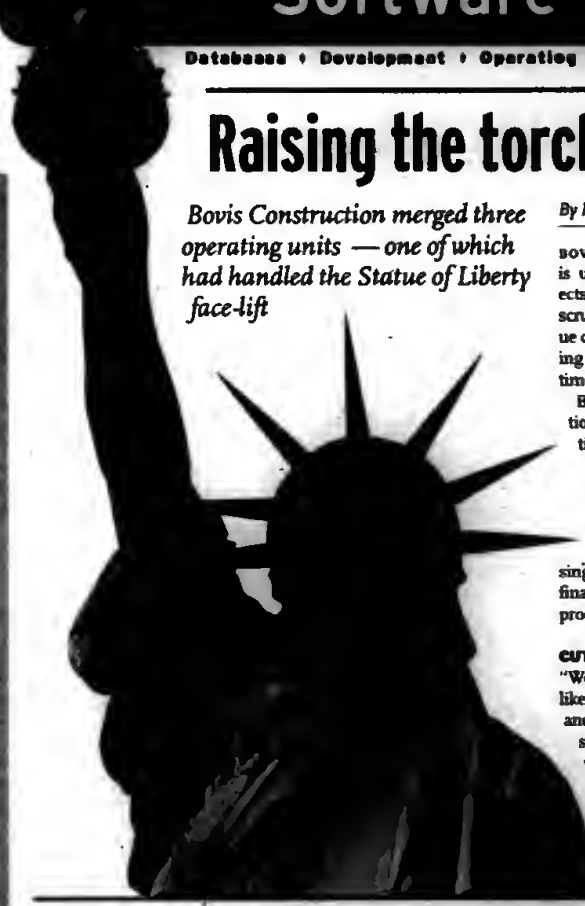
Raising the torch of client/server

Bovis Construction merged three operating units — one of which had handled the Statue of Liberty face-lift



By Randy Weston

BOVIS CONSTRUCTION GROUP is used to tackling tough projects, often under lots of public scrutiny, such as giving the Statue of Liberty a face-lift and making Ellis Island ready for prime time.

But an internal reconstruction faced much tougher scrutiny — by Bovis employees. Bovis U.S. merged three operating units that acted as independent corporations into a single company with centralized financial and administrative processes.

DISTRIBUTED COMPUTING

CUTTING INEFFICIENCIES

"We had a lot of duplication, like three payroll departments and three accounting divisions," said Steve Thomas, vice president of technology at Bovis' Charlotte, N.C., office. The trick was finding common ground that would improve the business processes at all three units while eliminating the inefficient practices.

Bovis, a subsidiary of The Peninsular and Oriental Steam Navigation Co. in London, has divisions in New York (which handled the Statue of Liberty project), Chicago and Charlotte. Each division concentrates on slightly different segments of the construction management and contracting business.

The company needed a system that would link the three divisions and connect 250 to 300 job sites spread around the country to the central system.

"Eventually, we want to use [network computer] and Web-based technology as much as possible to minimize the amount of equipment at the job sites," Thomas said.

Two of its divisions were already using software from Denver-based J. D. Edwards & Co. to manage their financial and administrative functions.

PeopleSoft, Inc. in Pleasanton, Calif., offered a better client/

Bovis, page 50

Easing on down the analysis road

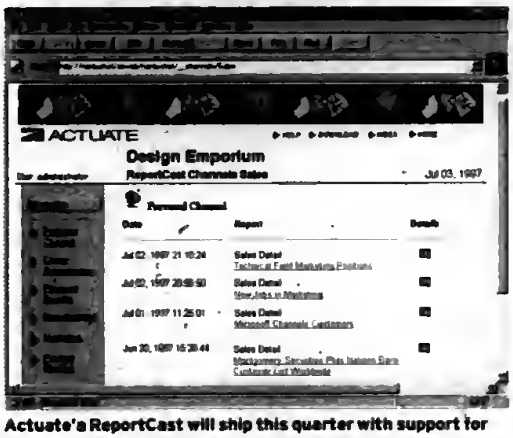
▸ *Web-based apps simplify end-user access to reports*

By Craig Stedman

SOFTWARE THAT can do complex data analysis may get most of the decision-support hype and glory, but some users are getting by with easier-to-digest tools that simply let end users read reports.

And oew World Wide Web-enabled reporting software should further ease the burdens of putting business information in the hands of users who don't have heavy-duty analytical needs, according to several beta testers.

For example, The Wharton School of the University of Pennsylvania wants to go the Web-based reporting route as it extends the distribution of administrative data and other information to a broader base of users. The Philadelphia-based business school hopes using the Web will minimize training and support hassles for its information systems staff.



Actuate's ReportCast will ship this quarter with support for pushing reports to users via Internet channel technology

Wharton runs query tools from Paris-based Business Objects SA for users who need to do "really intense data analysis," said Karen Kozlow, director of administrative computing at Wharton. "But now we want to go to the next level — people

Analysis, page 50

Cyrano eyes on-the-fly testing tools

By Sharon Gaudin

CYRANO, INC. is working to strengthen its testing tools so users can fix application bugs on the fly.

The company has bought runtime testing technology from Bankers Trust New York Corp. The technology, which was developed by the IT division of Bankers Trust, will be added to Cyrano's future tool packs, executives at the Newburyport, Mass.-based company told *Computerworld*.

The addition of the runtime testing technology to Cyrano's existing tool set will mean that users will on longer need to shut down their systems to test-run bug fixes in application code, Cyrano officials said. The offi-

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Software

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Briefs

Supply-chain software

Chesapeake Decision Sciences, Inc. in New Providence, N.J., is rolling out e server version of its Manager for Interactive Modeling Interfaces supply-chain and logistics forecasting tool. It is used to plan supply-chain capacity and shipping schedules. Chesapeake is preparing a fall release of its software, which was designed to give users access to the forecaster through a World Wide Web browser or through Windows across a corporate network.

IMI gets messaging

Industri-Matematik International Corp. (IMI), e Swedish developer of order fulfillment software, is integrating application messaging technology into its suite of products. The technology, from Swedish firm Frontec AMT, will let users better integrate different order systems and applications on different platforms.

Malicious applets

McAfee Associates, Inc., best known for its antivirus software, has turned its attention to hostile Java and ActiveX code. The Santa Clara, Calif., company this week will unveil WebScanX for Internet electronic mail and World Wide Web browsers. The software uses McAfee's Hunter virus engine to look for malicious applets. WebScanX will cost $39.95 retail. It also will be offered to corporate users as part of McAfee's VirusScan Security Suite.

VSE database gateway

Sybase, Inc. in Emeryville, Calif., announced the sale of its database gateway software for VSE-based mainframes to Viaserv, Inc., a small vendor in Boulder, Colo. Viaserv is taking over development, sales and support of the software, which connects end users to databases that run on VSE boxes. VSE is one of IBM's three mainframe operating systems. It is primarily used by smaller shops that don't need the horsepower of an MVS machine.

Raising the torch of client/server

Bovis Construction merged three operating units — one of which had handled the Statue of Liberty face-lift

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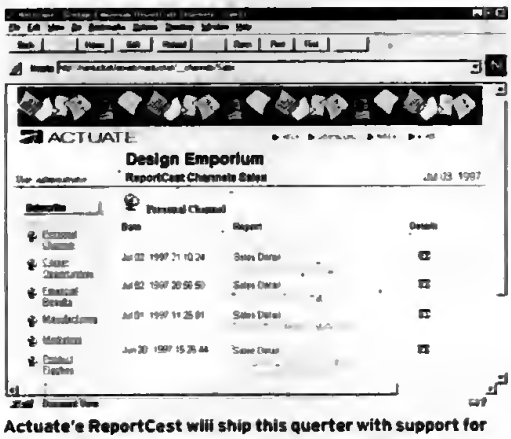

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Analysis tools go simple

CONTINUED FROM PAGE 49

who need to get at data, but that isn't the main part of their job," Kozlow said.

For such users, mastering full-fledged analysis tools "really wasn't worth all the time and money and effort," Kozlow said. Wharton built a homegrown reporting tool as an interim step and is testing a Web-based reporting product that Zanza Software, Inc. plans to announce this week. No purchase decisions have been made, "but this is definitely the direction we're aiming for," Kozlow said.

Zanza and rivals such as Actuate Software Corp. and Seagate Technology, Inc.'s software unit offer tools that let users read reports from Web browsers, with limited support for manipulating or drilling into the data. Besides ease of use, the tools carry the allure of lower cost compared with more feature-rich analysis software.

Complex query and analysis software has "all the sex appeal, but these tools in many respects are overkill for most users," said Wayne Eckerson, an analyst at Patricia Seybold Group in Boston.

Pricing for the ReportCast software that Actuate introduced this month starts at $16,500 per processor for a report server and an unlimited number of users. Zanza's Web Reports costs $5,000 with 30 browser licenses. Query and analysis tools can cost upward of $1,000 per user.

Montgomery Securities, Inc. uses an earlier Windows version of Actuate's software to distribute reports about stock trades. It is testing ReportCast. Back-office employees who rely on the reports don't need bells and whistles, said Fred Winograd, chief technology officer at the San Francisco-based brokerage.

EASY REFERENCE

"These are really reference reports, the equivalent of the [paper] reports we used to ship around on pallets," Winograd said. "The users just need to be able to find a record if there'a a question, and that they can do."

Web Reports, which is Java-based and lets end users customize their views of reports, is available on Windows NT and Unix servers from Zanza, in Menlo Park, Calif. Actuate, in San Mateo, Calif., plans to ship ReportCast this quarter with support for pushing reports to users via Internet channel technology.

Seagate'a Vancouver-based software unit shipped a browser client for its Crystal Information reporting software in March. It plans to add push capabilities in a release due in September. Last week, it announced a Web-enabled version of Crystal Reports, a lower-end tool that can be built in to applications. □

Bovis opts for distributed apps

CONTINUED FROM PAGE 49

server architecture for distributed computing. But J. D. Edwards was just starting to move to a more distributed architecture that would let Bovis roll out the applications to remote job sites and still maintain corporate control. Bovis signed on early as a development partner for the new software, called OneWorld.

CATCHING ON

Bovis officials wouldn't comment on the cost of the project or its projected savings. But Bovis Asia is standardizing on the same software platform, and Bovis Europe is eyeing a similar project.

Vinnie Mirchandani, an analyst at Gartner Group, Inc. in Stamford, Conn., said that although users have been demanding more distributed capability from their client/server applications, software vendors only recently began to deliver.

"It makes sense to centralize your operationa and not burden individual units with a lot of these processes. And you get the benefit of economies of scale," Mirchandani said. But he said shared services work with administrative tasks such as payroll and finance rather than customer-oriented processes such as order entry.

The trick was to find common ground among three operating units

Rich Driggs, a construction project manager at Bovis' Charlotte office, said the new system is making his office a lot more productive.

"One of the things we weren't doing well was cost analysis and job analysis," Driggs said. "It was being done by hand. With this new system, we are moving to automated analysis online. It'a going to be very timesaving and give us more time to focus on analysis than calculations." □

Cyrano boosts testing tools

CONTINUED FROM PAGE 49

cials signed the agreement late last week.

Users and analysts said the technology, if added successfully, would put Cyrano out in front of the testing tool vendor pack. It would give application developers the ability to test code changes and bug patches while continuing to give users access to data on clients and servers and in database applications, for example.

"Testing bug patches on the fly would be great," said Jeff Rogers, manager of database services at USF&G Insurance Co. in Baltimore. "It would save us time and money. We need to avoid downtime at all costs. Depending on the application, every minute of downtime means lost dollars and user dissatisfaction."

Michael Barnes, an analyst at Hurwitz Group, Inc. in Newton, Mass., said that move could put Cyrano'a products at the leading edge of an on-the-fly move in the testing tool arena.

"Any time you can keep real-time applications running, you could be saving up to millions of dollars a minute in lost revenue," Barnes said. "This would be huge with the year 2000 problem, because every code modification is a patch. And it would be huge with Web applications, because people need to access your applications while you're modifying them."

NEW TOOL PACKS

News of the deal comes a week after Cyrano announced that it was packaging its 16 tools into Cyrano Suite, four separate packs of products.

ClientPack tests the quality of Microsoft'a Windows-based clients, DBPack tests SQL performance, ServerPack tests the server transactions and VTPack tests large heterogeneous server-based applications.

Cindy Shaheen, manager of clinical application support at Flint, Mich.-based McLaren Health Care Corp., said Cyrano'a VTPack tools not only save her time and money, but they also minimize risks to patients.

Shaheen said the tools let her organization test and implement more applications for its blood bank than it could in the past.

"Prior to using Cyrano, we had to test the applications manually. The amount of testing we did in one week'a time with the tool would have taken us eight to 10 weeks, if not longer," she said. □

NEW PRODUCTS

CENTRA SOFTWARE, INC. has announced Symposium 1.0, software for delivering live, instructor-led training to corporate professionals via a World Wide Web browser.

According to the Lexington, Mass., company, Symposium 1.0 creates a live virtual classroom experience with multipoint audio conferencing, synchronized viewing of multimedia content, moderated discussion forums, text chat application sharing and whiteboard capabilities.

Pricing starts at $35,000 for 50 users.

Centra Software
(617) 861-7000
www.centra.com

SRC SOFTWARE has announced Advisor Series, Version 7.0, software for budgeting and reporting.

According to the Portland, Ore., company, this version combines relational online analytical processing-type database technology with a live spreadsheet interface from Microsoft Excel. It can produce budget-to-actual performance results, currency translations, long-range forecasting and automatic electronic-mail reporting for use on company intranets and the Internet. It is compatible with Windows 3.1, Windows 95 and Windows NT. SRC plans a Lotus 1-2-3 '97 version.

Advisor Series, Version 7.0 costs $9,995.

SRC Software
(800) 544-3477
www.srcsoftware.com

KNOWLEDGEX, INC. has announced KnowledgeX, software for converting a range of information into intelligence for competitive purposes.

According to the Atlanta company, KnowledgeX is a knowledge manager-type software that graphically displays relationships from sources such as the Internet and corporate databases.

The program includes four steps: acquisition, discovery, publishing and distribution using electronic mail. It runs on Windows NT and Windows 95.

Pricing starts at $25,000.

KnowledgeX
(404) 816-4807
www.knowledgex.com

WYSE TECHNOLOGY, INC. has announced WyseWorks Terminal Suite, software to enable PCs and Windows terminals in networks to work together to access older and modern Windows applications.

According to the San Jose, Calif., company, the suite lets users access legacy accounting and finance programs to receive the full benefit of an investment in new PC hardware.

WyseWorks Terminal Suite costs $468.

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INSIDE:

Editor's Note

The Top 5 Resellers/Integrators

Megadeals March On

Business Process Outsourcing

Web Wizards

Year 2000 Implications

Charting Integration Revenue

Editor's Note

Next to object technology, systems integration services may be the most vexing, intangible purchase IT leaders face. Why? Because they're betting that an outside concern will generate mission-critical environments, spark applications interoperability or breathe new life into old systems better — and perhaps less expensively — than their own IS organizations.

At minimum, it's a calculated risk. At maximum, it's a potential career-ending maneuver. Either way, IT leaders have enormous incentives to get it right.

Computerworld's examination of systems integrator customer satisfaction comes as organizations across all segments are counting more heavily on "outsiders" to assist their financially besieged and skills-deprived IS departments with increasingly complex and daunting workloads. The worldwide systems integration business grew 9.4% to $35.3 billion in 1996, according to International Data Corp. And that dependency is expected to strengthen: The market is expected to reach $60.3 billion by 2001.

And the deals are getting more extensive. Womb to tomb outsourcing deals, once thought to be nearing extinction, are on the rise (see story page S10). And the systems integrator's influence is extending from data centers and server closets into the heart of the workplace (see story page S13).

Given this panoramic picture, distinguishing those integrators that are good at satisfying customers from those that aren't is paramount.

Starting last March, we contacted some 15,000 IS managers on their systems integration satisfaction across a range of functional, technical, managerial and business categories regarding the two most critical projects on which systems integrators had worked in the past year. From there we distilled the responses to focus on as many "name" integrators as possible. We then worked the phones to obtain at least 40 completed surveys on each integrator. After totaling the scores, we ranked the Top 15 (see chart below).

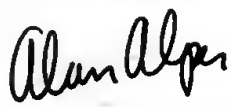
We did the same for an emerging class of systems integrator: resellers that have moved upstream to provide a mix of integration services. Keeping these two groups separate allowed for a fairer comparison among like-minded vendors (see story page S9).

Two obvious findings stand out. Hardware vendors dominate the Top 5. Many of these vendors have seen margins diminish and customer loyalty fade. They are turning up the volume on more profitable systems integration services. And in the case of some players, if they don't service the heck out of their installed base, which has become increasingly multivendor, they will have little business on which to build.

Second, the pure-play consulting and professional services firms will likely argue that interviewing IS people skews the results because they sell to top management. Our answer: That may be true, but it is usually IS staffers who work with consultants and may be in the best position to assess the quality of their work.

And like beauty, systems integration satisfaction is in the eyes of the keeper of the IT jewels: the IS department.

You'll find bonus coverage on our @Computerworld site at www.computerworld.com/si.



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Satisfaction Rankings of Systems Integrators

	Overall Satisfaction	Business Practice	Project Management	Technical Performance
1.	Digital Equipment Corp.	Digital Equipment Corp.	Digital Equipment Corp.	Digital Equipment Corp.
2.	Unisys Corp.	Unisys Corp.	Unisys Corp.	Unisys Corp.
3.	IBM	IBM	IBM	IBM
4.	Deloitte & Touche	Hewlett-Packard Co.	Shared Medical Systems Corp.	Hewlett-Packard Co.
5.	Hewlett-Packard Co.	Deloitte & Touche	Hewlett-Packard Co.	Deloitte & Touche
6.	Oracle Corp.	Computer Sciences Corp.	Deloitte & Touche	Shared Medical Systems Corp.
7.	Cap Gemini America	Shared Medical Systems Corp.	Computer Sciences Corp.	Computer Sciences Corp.
8.	KPMG Peat Marwick	Cap Gemini America	Cap Gemini America	Cap Gemini America
9.	Shared Medical Systems Corp.	KPMG Peat Marwick	KPMG Peat Marwick	KPMG Peat Marwick
10.	Computer Sciences Corp.	Oracle Corp.	Oracle Corp.	Oracle Corp.
11.	American Management Systems	American Management Systems	American Management Systems	American Management Systems
12.	Ernst & Young	Ernst & Young	Ernst & Young	Ernst & Young
13.	Price Waterhouse	Electronic Data Systems Corp.	Electronic Data Systems Corp.	Electronic Data Systems Corp.
14.	Electronic Data Systems Corp.	Price Waterhouse	Price Waterhouse	Price Waterhouse
15.	Andersen Consulting	Andersen Consulting	Andersen Consulting	Andersen Consulting

Source: Computerworld

Satisfaction the hardware way

By Cheryl Gerber

THE BUBBLING HOT SYSTEMS INTEGRATION market has driven hardware manufacturers in recent years to fine-tune their services divisions, then boost them with further technical and business consulting capabilities. Those efforts paid off this year when customers chose them as four of the Top 5 systems integrators with which they are most satisfied. Only one of the Big Six accounting firms — Deloitte & Touche Consulting Group — made the Top 5 this year. Hardware vendors, pinched by shrinking margins and waning customer loyalty, are building systems integration services par excellence across platforms and technical areas. To succeed, they've had to build consulting skills in business processes and project management — disciplines at which the Big Six usually excel.

There are several reasons integrators are in demand today. The poverty of information technology skills of all shapes and forms leads the list. Today's recognition that IT is not a back-office expense hog but a front-office revenue generator has added urgency to the need. Plus, the Year 2000 problem (see story page S16) has exacerbated demand for integration help. Add the explosion of the Internet and electronic commerce, and the demand for integration services boils up again.

In a climate where demand outpaces supply, systems integrators that are ready (and not so ready) to augment IT staffers have been elevated to rainmaker status, said Mike Vargo, a vice president at Gartner Group, Inc. in Stamford, Conn.

And there is no shortage of work for the rainmaker during times of drought. "Systems integrators have more work than they can deliver. Their challenge is to determine which jobs to take and which to turn down," said Bonnie Digrius, Gartner's vice president of consulting and systems integration.

HAND-PICKED PROJECTS

The need for services has led to some cherry-picking of projects that provide the greatest returns. But it has also forced hardware manufacturers that are relatively new at the services game to focus. "When you begin a new business and you are a global company, you tend to assume you can do it everywhere. We went too far before we started reining it back in and tightening up the focus," said James Unruh, chairman and chief executive officer at Unisys Corp. in Blue Bell, Pa. (Unruh recently announced he would retire as of next year.)

Selectivity has led to some client stratification between the strategically important "A" clients, where integrators place their best talent, and the "B" group, which gets a mix of good and not-as-good staffers, said Susan Siew-Joo Tan, systems integration analyst at International Data Corp. in Framingham, Mass.

With stratification comes increased specialization. Digital Equipment Corp.'s Services Division, for example, consolidated all professional services into one division last July and sought to leverage its early partnership with Microsoft Corp. on Windows NT by specializing in NT projects. To meet the demand for NT integration, Digital will hire continuously throughout the year. "We plan to double the current number of 1,350 Microsoft-certified employees to about 2,500

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Digital Hits its Stride

Vendor gets high marks for customer commitment, complaints about costs for small projects

Digital Equipment Corp. has built its reputation for services on Microsoft Corp. Windows NT/Unix integration expertise and its ability to integrate, with relative objectivity, its own products with others.

Larry Sikon, director of technical services at Montgomery Securities, found Digital to be more committed to serving customers than to serving its own manufacturing base. "They are not hung up on Digital only. Of course they tried to get me to buy Alpha-based equipment, but their major focus was on the services," Sikon said.

Amidst other integration services, Digital helped the San Francisco-

Digital, page S4

SYSTEMS INTEGRATORS

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Digital, page S4

Digital Services Division's Kannaniote Srikanth (left) and John Rando

Mark Ascott

Unisys Does a Se

Revamping its service record and attitude, Unisys has surprised customers such as Farm Credit

Seven years ago, Unisys Corp. was worn and adrift. If it wasn't about a mainframe, customer service was anathema.

"Service levels were awful. Attitude was bad. They were rude. They were unresponsive. We finally dropped their contract for PC maintenance in 1990," said Dave Martin, chief information officer at Farm Credit Services of Mid-America, an Agricultural Credit Association consisting of 135 branch banks and headquartered in Louisville, Ky.

Unisys Corp.

1996 Total Revenue: $6.2B

1996 Integration Revenue: $1.9B

***Strengths: Support and service; ease of doing business with integrator**

***Weaknesses: Integrator's knowledge of your business; technical expertise**

*Source: CW SI Satisfaction Survey

Last year, however, Farm Credit issued a request for proposals for an integrator to tie together branch offices over a wide-area network using MCI Communications Co.'s frame-relay service. Farm Credit was surprised when Unisys showed up — with an in-depth presentation and pricing that killed the competition. "We let them know up front what an awful experience we had had with them. They were going to have to convince me that they weren't the same company," Martin said.

Unisys responded, "You write the contract and we'll sign it." And that's just what Martin did. "I was a demanding customer because of what had happened in the past. But there has been an immense turnaround in customer service. Now they say, 'Whatever you need, we'll do it.' And they do it. We're very comfortable with them," he said.

Unisys has made customer satisfaction a top priority in the past few years, analysts say. "They do everything they can to make sure the customer is satisfied, often at the expense of profitability," said Susan Siew-Joo Tan, systems integration analyst at International Data Corp. in Framingham, Mass.

Improved customer service is partly the result of restructuring into three business units in October 1995, which helped focus Unisys on delivering different types of services. One of three business units, the Information Services Group (ISG), covers commercial systems integration, consulting and outsourcing.

In 1995, Unisys' ISG set about instituting vig-

Digital Hits its Stride

CONTINUED FROM PAGE S3

based securities firm migrate from a Macintosh to a Windows NT shop. "They integrated NT with a dozen off-the-shelf and homegrown applications and everything on the back end from NT Wintel servers to Sun servers to AS/400 servers," he said.

But some analysts say Digital is top notch only in certain contexts. "With their key customers they will be great, but we have heard that they are not so great with their nonstrategic customers," said Susan Siew-Joo Tan, systems integration analyst at International Data Corp. in Framingham, Mass.

One user noticed a cost disparity between the larger and smaller jobs Digital did. "For small projects their total cost seems to be less competitive — they have overhead to account for — whereas big projects are more economical," said Henry Chow, director of technical systems at Lexi International, Inc. in Los Angeles.

Chow was satisfied with the outcome of a large network integration job in which Digital restructured Lexi's network from one based on PC servers, routing and Novell, Inc.'s NetWare to a Fiber Distributed Data Interface (FDDI) switching network. "They handled the cabling, the design and implementation of the FDDI network. It was very professionally done. They have vast technical support capabilities," Chow said.

Digital Equipment Corp.

1996 Total Revenue: $14.6B

1996 Integration Revenue: $6.2B

***Strengths: Technical expertise; problem resolution**

***Weaknesses: Training; knowledge of your business**

*Source: CW SI Satisfaction Survey

Digital also gets good grades for the obvious: integrating its own equipment. "Our hardware is from Digital, and I believe they really have a leg up in supporting their own hardware," said David McAllister, chief information officer at Indianapolis VA Medical Center. The VA hospital has extended Digital's traditional hardware support to include networking, database design, operating system support and systems management training.

Things haven't always been this good for Digital. In 1994, it laid off 16,000 employees and began a three-year bout of zero or subzero net income. "We learned from the school of hard knocks," said John Rando, Digital Services Division vice president and general manager.

The recovery began in 1995 when Digital punched out a threefold strategic focus on high-performance (64-bit) enterprise Unix, Windows NT integration and networking business.

Last year, Digital restructured its services business from a geographic approach to a customer and competency-centered approach that more befits a services company. Then it identified the businesses and projects it didn't want and "got out of them gracefully," said Kannankote Srikanth, vice president and general manager of Network and Systems Integration Services, one of three units in the Digital Services Division.

Digital Services recently elected to get out of the hardware and software maintenance business by outsourcing to Electronic Data Systems Corp. in a $500 million-plus contract. EDS will design, develop and implement a new set of common business practices to improve the process of customer service administration. The deal makes sense, one analyst said. "Digital doesn't have the operational expertise in this that EDS has as a specialty," said Mike Vargo, vice president of management of tech-

orous proposal and project review processes for the purpose of understanding and meeting customer expectations effectively. One of the biggest obstacles to converting a technology company into a services business was institutionalizing a different mind-set about the business. "This was historically an engineering and sales company. We wanted to set in place a line of thinking about customers' business problems before choosing a market," said Barbara Babcock, vice president of marketing and strategy at ISG.

KNOW YOUR STRENGTHS

ISG identified its competencies as large-scale project management, document imaging and workflow, legacy and open systems integration and Year 2000 conversions. There are, for example, Year 2000 managers for each of the five market segments: banking, insurance, transportation, communications and public sector.

Unisys bought the rights to a project management methodology and tailored it to Unisys' culture. Then top ISG managers institutionalized the methodology so consultants worldwide understood the life cycle of a project and their responsibilities for it. ISG laid the groundwork to ensure that project proposals were similarly structured and properly examined before they went out the door. "It's as much of a protection as a culture-building activity," said Bob Tumanic, managing principal of ISG Practice Operations and the Systems Integration Center of Excellence.

Converting a technology company into a services organization is a challenge, Tumanic said. To accomplish this, it is necessary to train consultants to be less provincial in their thinking, he added. While the group has come a long way, it is not yet where it needs to be. "We are changing the way people think about how to add value to a client relationship," Tumanic said.

Based on customer feedback, the rigorous change process has begun to pay off for Unisys. "We have become much more savvy about understanding our clients," Babcock said.

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nology at Gartner Group, Inc. in Stamford, Conn.

Digital also sought to reshape itself into more of a distributed, peer-oriented structure. For example, there are heads of countries such as Germany and the UK, but there is no head of European operations. Rando and Srikanth opened up management to include employees who are closer to customers than to corporate. "People who are closer to customers are more valuable to me than people who are closer to me," Srikanth said. Today, it's not uncommon for employees who are closer to customers to make more money than those who are higher up on the organizational chart, he said.

When there are problems with customers, Srikanth tells staffers to fix the problem first and then deal with the business or contractual issues. "You don't do this forever so you lose money. But at the same time, you show flexibility and willingness to help the customer so they see that we are not a company that is driven solely by terms and conditions," he said.

One of the biggest obstacles Digital said it faces is achieving recognition in the services market as a legitimate systems integration player. "I find that we have to work much harder to get the grade. We are always faced with, 'Oh, you are Digital. You just want to sell your box.' " Srikanth said.

IBM Sports a New Attitude

Changes such as a relaxed dress code and a more involved sales force have paid off in an improved commitment to customer satisfaction

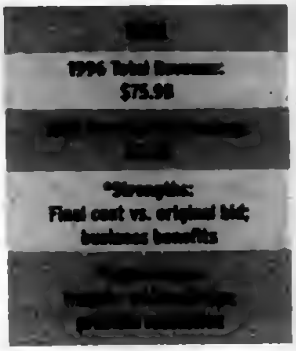
The huge IBM installed base ought to mean a foot in the door for services. But customers weren't eager to admit IBM, mostly because of an attitude problem. However, that Big Blue chip on the shoulder seems to have disappeared.

"Three years ago, they thought they had all the answers," said Gary Baxter, chief information officer at Maine Employees Mutual Insurance Co. in Portland, Maine. "How you treat people is a very important part of the business relationship. It's that simple," he said.

IBM got an attitude adjustment. "The change in IBM is huge — just huge," said Judy Schneider, director of information systems at Washington Social and Health Services in Olympia, Wash. "Three years ago, we had the IBM project manager from hell. She was arrogant and inflexible. She said it was going to take 14 months and cost $14 million more than we thought." Plus, there was arrogance from the regional manager and a sector vice president, she said.

In 1994, the Washington state agency served IBM with an intention to terminate its contract for default. IBM pulled it together fast, replacing the project manager, the regional manager and the sector vice president with more creative and cooperative staffers. "Then they brought in IBM experts from all over the country at no extra cost. They renegotiated the contract, rebalanced deliverables within existing dollar limits and developed a new project plan that was a life saver. They did whatever it took to hold on to that project plan," Schneider said.

IBM also had to prove itself at Maine Employees Mutual before the AS/400 shop would award the giant a network integration job. But that's just what IBM seems to have done. IBM services employees no longer just sit around and wait for another hardware purchase order. "It's an attitude change. There's a noticeable improvement in the method and depth of their involvement. They stop by. They call. They give us ideas. They're a really good partner," Baxter said.



*Source: CW SI Satisfaction Survey

DEVIL IN THE DETAILS

Changes in seemingly insignificant details such as dress code have also helped IBM prove its new perspective. Instead of wearing a starched white shirt and a tie, Baxter noted, an IBM service provider working in the office next to his had donned a golf shirt. He appeared relaxed and approachable.

The careful tuning of attitude is one of several changes that the IBM Global Services Division has implemented in recent years. "IBM used to be more of a hero-based culture, but we have done a lot to build a team-based culture. We've coached people in the new climate we're trying to create at IBM," said Frank Roney, general manager of Integration Services, a Global Services business unit in Somers, N.Y.

The coaching appears to have paid off. "I have noticed an improved commitment to customer satisfaction — a flexibility and responsiveness that is a notch above where they were two years ago. IBM is now willing to change the contract to meet today's needs," said Cris Jensen, deputy director of the California Health and Welfare Agency in Sacramento. IBM is integrating a new care management system for the agency.

IBM also unified processes and merged Integrated Systems Solutions Corp. and the Consulting group.

"When they were separate, it was confusing to customers because they weren't sure which pool of talent they were dealing with. Our processes weren't consistent," Roney conceded.

Marc Bacon

IBM has restructured in recent years from a geographic to an industry coverage model. "That way, customers are not teaching us their industry each time," he said.

According to Baxter, his relationship with IBM is no longer like a customer/vendor relationship. "It's more like a partnership. They want to know what the problem is from our point of view, and they involve us in the problem-solving process," he explained.

Deloitte & Touche Consulting Takes Cooperative, User-Friendly Path

Clients of this Big Six firm boast it takes customers' input seriously, while satisfying market focus and technical discipline make for gratifying engagements

Customers say Deloitte & Touche Consulting Group is the most congenial of all the Big Six accounting firms. That, in addition to the fact that the consultancy has strengthened its expertise in certain areas, has made it a top choice among a growing number of information systems shops.

The integrator has built up a reputation for strong SAP AG and PeopleSoft, Inc. implementation, industry-specific expertise and business process re-engineering (BPR) skills. David Johns, director of global development at Owens Corning, Inc., for instance, is satisfied he chose Deloitte & Touche Consulting Group to plan and implement SAP worldwide.

"We set an aggressive implementation schedule. The other integrators we talked to told us we were nuts, but Deloitte & Touche was willing to work within our requirements — and they have delivered on them," Johns said.

Deloitte & Touche Consulting Group

1996 Total Revenue: $1.6B

1996 Integration Revenue: $967M

***Strengths: Project management skills; transfer of knowledge**

***Weaknesses: Support and service; technical expertise**

*Source: CW SI Satisfaction Survey

BIG SIX UP AND COMER

Analysts say Deloitte & Touche Consulting Group is simply easier to deal with than the other Big Six firms. "We hear time and again that they are the most user-friendly of the Big Six. They are definitely the up and comer amongst the group. They've developed stronger technical expertise, and they have good customer relationships," said Stan Lepeak, vice president at Meta Group, Inc. in Stamford, Conn.

Owens Corning also chose Deloitte & Touche Group Consulting because the company demonstrated a good relationship with its partner ICSD, an SAP implementer in Chadds Ford, Pa., that the firm acquired in 1995. The acquisition gave Deloitte & Touche Consulting Group a leg up on SAP implementation, industry observers say.

Other users have also chosen Deloitte & Touche Consulting Group because of the firm's cooperative consulting style. John Cuddy, chief information officer at the Oregon Department of Human Resources in Salem, Ore., has worked with Deloitte & Touche Consulting Group for the past 20 years of his professional life, both in public and private sectors. "When I look at the entire range of who I've dealt with, they have been collegial and easy to work with," Cuddy said. "When I've had to deal with the exception to this rule, Deloitte has been the quickest to reassign the consultant. They take the customers' response to their consultants very seriously," he added.

Like everyone these days, Deloitte & Touche Consulting Group must constantly recruit and train staffers. "We have doubled the recruiting, developing and education of staff in each industry segment in the past year. Employee growth now ranges from 15% to 35% per year," said Stephen Sprinkle, managing partner, Service Line, at Deloitte & Touche Consulting Group in Atlanta.

The company recruits continuously from both industry and university campuses. The challenge is for Deloitte & Touche Consulting Group to develop in-depth expertise in multiple disciplines and then train consultants from different backgrounds on how to work together cooperatively, according to Sprinkle.

To ensure that its staffers are creating customer satisfaction, Deloitte & Touche Consulting Group has a policy of assigning review partners as backups to project engagement partners. The review partner identifies issues that the customer may not feel comfortable discussing with the engagement partner. "This is our [customer satisfaction] insurance policy," Sprinkle said.

PRIORITY TO CUSTOMERS

The firm appears to make customer needs a priority. "Our mission statement reads 'We disdain arrogance,' " Sprinkle said. Indeed, arrogance did not seem to be an issue for Deloitte & Touche Consulting Group's customers. The firm planned, developed and implemented a client/server application for case management of senior citizens' service eligibility at the Oregon agency.

"They brought this in on schedule and on budget. Some vendors have a bias in the direction of what they're selling. But Deloitte is objective. They are just trying to meet our needs," Cuddy said.

The Big Six firm recently completed a PeopleSoft implementation on an Oracle Corp. database at Norrell Corp. in Atlanta. "They are very easy to work with. We couldn't tell who was working for Deloitte & Touche and who was working for Norrell," said Tom Porter, Norrell vice president of technology and business systems. Porter said he trusts the consulting firm. "They backed up what they said they would do," he added.

One customer, however, said Deloitte & Touche Consulting Group could stand to improve the execution side of project management. "Our experiences with Deloitte on the planning and contractual side were outstanding," said Dennis Lowe, corporate comptroller at Weyerhaeuser, a paper products company in Seattle. "The downside was in the execution area, where there were some missed cues both in knowledge base as well as execution. Probably about 70% of what had been anticipated was actually delivered," he said.

Despite the downside, Deloitte & Touche Consulting Group still left a positive overall impression. "On balance, we were pleased with the portion that we did receive," Lowe said.

Bruno Stevens

Deloitte & Touche Consulting Group's Stephen Sprinkle says customer needs are a priority

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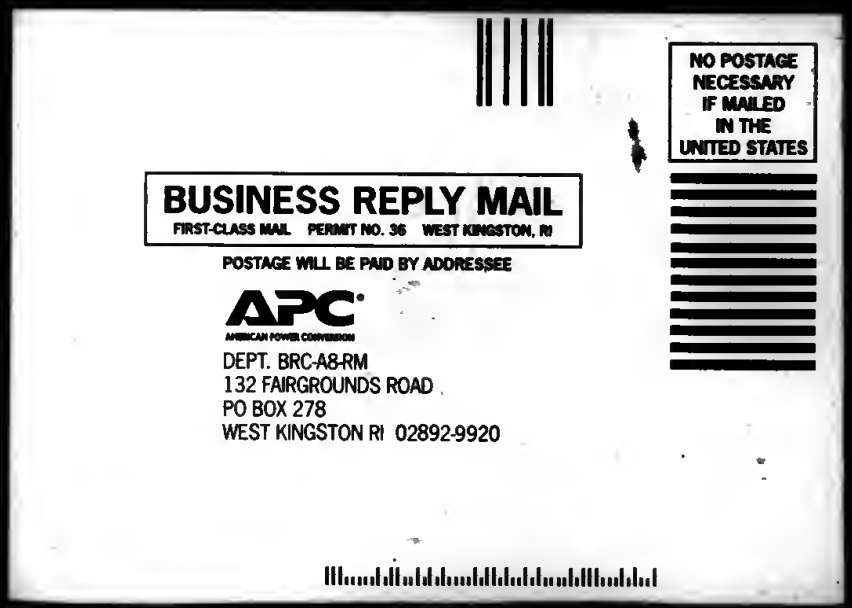
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Hewlett-Packard Makes Good Use of its Partners

Whether it's working with Big Six firms or small vendors, HP is leveraging others' talents to enhance service

Hewlett-Packard Co. has embraced the services business by cultivating key partnerships that either serve to divide customer delivery responsibilities realistically or leverage the respect the company has established in the market for its role in developing both standard and advanced technology.

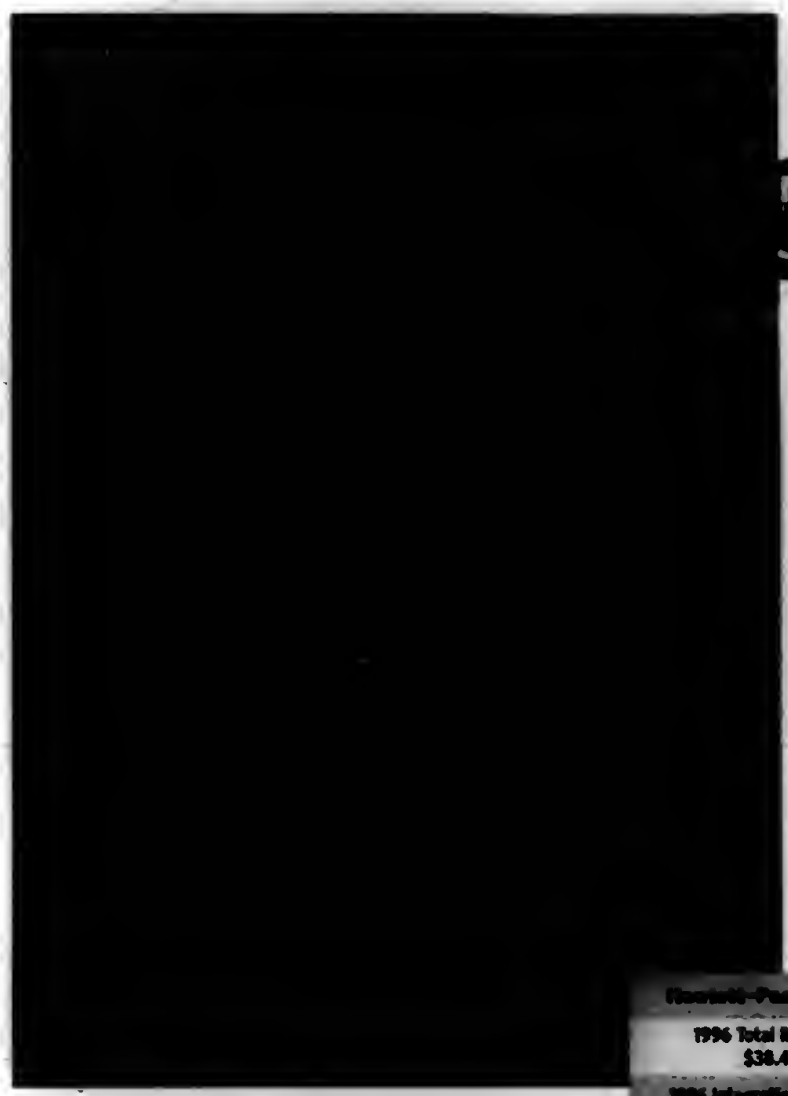
"Hewlett-Packard is willing to work not only with the Big Six but also with up-and-coming software vendors like Netscape. And we haven't seen other hardware vendors being as aggressively hardware-neutral as HP. HP is more open to providing best-of-breed solutions," said Stan Lepeak, a vice president at Meta Group, Inc. in Stamford, Conn.

Dennis Barry, vice president of finance and administration at JBL Professional, chose HP from nine companies he evaluated for a project implementing SAP AG's R/3 on HP/9000 machines.

"HP was the only one willing to guarantee time and cost of implementation. Also, I have a lot of respect for the HP product," Barry said. JBL is a Northridge, Calif.-based audio business unit of Harman International.

While customers' respect for its technology has opened the services door to HP, the company has also had to deemphasize its focus on technology to be effective in services. HP has restructured twice in two years to focus on services, first moving the Professional Services Organization outside hardware maintenance and aligning it with the direct sales organization. But the services business still fell under the product-oriented Computer Systems Organization.

"We were still very reactive and centered around HP products and an after-sale service mentality," said Jim Sherriff, general manager at Hewlett-Packard Professional Services Organization.



Amy Petrella

Hewlett-Packard Co.

1996 Total Revenue: $38.4B

1996 Integration Revenue: $1.9B

***Strengths: Problem resolution; support and service**

***Weaknesses: Project management skills; knowledge of your business**

*Source: CW U Satisfaction Survey

TEARING DOWN WALLS

One of the biggest challenges for HP was eliminating the barriers among services organizations, Sherriff said. In May, the company fixed the second structural problem by unifying Worldwide Customer Support Operations and the Professional Services Organization under one roof.

Once organized, HP developed solution sets and a consulting process method around three worldwide competencies: telecommunications, financial services and manufacturing. Then the company sealed partnerships with Ernst & Young, Andersen Consulting and Price Waterhouse to divide responsibility for delivering the services.

Within the partnerships, HP will deploy solution sets and technology, such as network and systems management, and the partners will align them in a broader business context. The advantage of HP's partnering approach is that the company now does fewer things better, Sherriff said.

"HP has been explicit that they are not trying to do what the Big Six does. That has served them well. That's why they've been able to partner well with the Big Six," Lepeak said.

HP has added 2,500 of its own consultants, project managers and engineers with industry-specific expertise during the past three years. The hiring effort has doubled the services staff to 5,000 consultants worldwide, Sherriff said.

According to Barry, HP has had trouble at times finding the right talent. "But they kept on trying until they brought in the right staff to do the job. HP is committed to making me successful," he added.

The company is also committed to processing and applying the results of various customer feedback mechanisms. "The No. 1 issue was that we were far too apt to provide choices rather than recommendations," Sherriff said.

To correct the problem, HP increased training in technology deployment, methodology delivery process, business-to-IT alignment, questioning techniques and managing group dynamics.

According to JBL's Barry, HP acts on customer feedback. "When we gave them feedback that they were weak in postimplementation support, HP corrected the problem right away," Barry said.

Satisfaction

CONTINUED FROM PAGE 53

by the end of 1997," said John Rando, vice president and general manager of the Digital Services Division.

Beseiged by staffing and other problems, IT firms have turned to the simplicity of using hardware manufacturers for services that revolve around their products. "We find that these projects are very technical, tend to be smaller in scope and easier for the hardware vendor to do. You get very good technical service from the hardware manufacturers. They do a good job of integrating their own machines, and that boosts customer satisfaction scores," Siew-Joo Tan said.

Meanwhile, hardware manufacturers have needed the services business as their technology became increasingly indentured to Wintel products. "In 1991, we looked at the future of our maintenance business. We determined that it would decline. Our conclusion was that our maintenance business lent itself well to networking," Unruh said. Unisys then began planning the capabilities needed to build a networking services business.

Hardware manufacturers had to incorporate more of the so-called soft skills to succeed in the services business. "The transformation of a technology firm into a services firm requires a different kind of client commitment. It's not a product sale; it's a service. You've got to round off the edges in a technology company to get them more services- and relationship-oriented," said Bob Tumanic, Unisys managing principal of worldwide practice operations. He spent 15 years at Deloitte & Touche Consulting Group before moving to Unisys two years ago.

During those two years, Tumanic and others in the Unisys services business have been institutionalizing a consulting methodology that teaches how to propose and build engagements with clients and how to understand the life cycle of a project, its structure and their responsibilities in it.

Life cycle and methodology have always been strong suits of the Big Six. But these firms are finding it harder to please technically oriented clients.

Big Six firms were criticized by at least two analysts interviewed for being arrogant and inflexible. Their poor planning often results in budget and time overruns, analysts said. Andersen Consulting was fingered as having the worst reputation in this regard. "The biggest complaint we get is that [Andersen] brings in people who don't know what they are doing and are learning at the customer's expense," said Stan Lepeak, a vice president at Meta Group, Inc. in Stamford, Conn. Ongoing Meta research summarized the dissatisfaction with Andersen in a 1996 report originally entitled, "Universally Hired, Universally Hated."

Gartner's Vargo has also encountered complaints about Andersen, which ranked 15 in *Computerworld*'s customer satisfaction study.

Andersen did not respond by press time.

Yet the firm is basking in the services sun. "Andersen is growing at 23% per year," Digrius said.

But services disgruntlement reaches way beyond Andersen. IT shops across the country lament the IT skills shortage that hobbles many IT initiatives.

With the market this hot, holding on to skilled people is as difficult for IT departments as it is for integrators. But no matter whether an integrator's roots are in hardware or consulting services, "there's room for everyone," Gartner's Digrius said.

Gerber is a freelance writer in Kingston, N.Y.

COMMENTARY

Turning Contracts into Partnerships

By Susan Scrupski

IN THE OLD DAYS, a scant decade ago, systems integrators would characterize their stake in a large deal by proudly claiming they had "skin in the game." By this they meant they had made a sizable investment: buying the customer's assets, transferring the customer's employees to its staff, maybe transferring software licenses onto their books and so on. The transaction delivered a large "cash infusion" to the customer that often totaled millions of dollars. It dressed up the customer's balance sheet nicely and ultimately relieved the company of running its own IT infrastructure.

Peter Sibley

Well, those boastful claims made for good press, but in the final analysis, what did the outsourcing vendor really risk? Not much. The contracts were signed for 10 years, typically for a fixed price at a decent margin. Further, vendors could count on an abundance of profitable add-on work that invariably crept into the long-term relationship.

So where was the "skin in the game"? It was more like money in the bank.

One outcome of those painful growing years is the emergence of a new direction in contracting that holds great advantages for vendors and customers. Referred to as business benefit contracting, or "gain-sharing," these new contracts are more truly akin to partnerships than any other form of customer/vendor relationship. The central idea is that the vendor's compensation is vested in delivering a successful business result.

Now the only problem with gain-sharing contracts is that they are all unique so you can't replicate them easily. But what you can do is have a frank discussion with your vendor or choice of vendors and explain in detail what you need to accomplish in strategic terms. Then give the vendors plenty of time to come up with a variety of alternatives. Each recommendation should be tied to a business metric that you and the vendor establish.

Coming up with the yardsticks to measure success will vary wildly by company. Your best bet is to isolate a business indicator that both you and the vendor can agree is fairly easy to measure. If it's a fairly routine procedure, make sure you establish a baseline to gauge performance improvements. If it's a new procedure or process, specify what the expected results should be. Establish a minimum threshold. (A word to the wise: Establish a maximum or cap, or your vendor could get too rich too quick.)

Gain-sharing has been going on for some time in the government market. But in the commercial market, the opportunities to craft creative gain-sharing contracts are limitless. Claremont Technology Group, a systems integrator in Beaverton, Ore., is experimenting with gain-sharing contracts. One client, a large telecommunications company, agreed to kick in a per-transaction fee to help fund a billing system for a new line of business. The business metric in this case was simple. The system itself is keeping score of the gain-sharing arrangement.

One vendor that has become very comfortable with the practice is Perot Systems. The company estimates that nearly one-third of its existing contracts have some kind of risk/reward element to them. Moreover, in its pipeline of new business, the company estimates that nearly 70% of contracts are unique gain-sharing arrangements.

In the ultimate "put your money where your mouth is" scenario, Perot Systems is being compensated in part by shares of Western Pacific Airlines' common stock. Several Perot Systems deals have a revenue growth or expanded market share baseline metric tied to their compensation. So whether they're processing mortgages, making air travel and auto reservations or consolidating traders' desktops, Perot Systems' revenue is integrally linked to realization of a predefined business goal.

EDS is also seeking out key business processes where it can add real value and establish measurable business objectives to gauge improvements to those processes. One of the flagship examples of EDS' "cosourcing" foray is with Kellwood Co., an international apparel manufacturer in St. Louis. EDS is being measured on and compensated for reduction in costs of goods sold, increased customer satisfaction, improvement in margins, increasing time-to-market performance and improved inventory management.

The fundamentals to making gain-sharing relationships work include a high level of industry expertise (on the part of the vendor) to establish baseline business metrics; a sound business strategy (on the part of the customer); a fair compensation scheme; flexibility to tweak the contract over time; clear and well-documented gain-sharing criteria; a strong executive management team; and an unshakable trust in the partnering company.

There's nothing like a profit motive to make fast friends out of arms-length adversaries. And customer satisfaction reaches new heights when you can turn to your vendor at the end of the day and ask, "Was it good for you?"

Scrupski is editor of the "IT Services Letter" and executive vice president at management consulting firm Technology & Business Integrators. She can be reached at scrupski@tbicentral.com.

Upping the ANTE

Resellers move upstream with a broader range of integration services

By Cheryl Gerber

The Top 5 resellers are well on the way to being full-fledged systems integrators. Interestingly, they share common threads: They have dressed up beyond bare-bones box pushing to don rich services offerings for their customers.

These companies tend to provide services for short-term projects that primarily involve PCs and workgroups, local- and wide-area network integration and legacy connectivity. They don't tend to offer custom software for vertical markets or business function specialties like the large-scale systems integrators do.

No. 1, MicroAge, Inc. in Tempe, Ariz., has unveiled one service after another this year, with offerings more in line with those of a bonafide systems integrator. These include help desk, asset management, business recovery and network services.

MicroAge sports another characteristic common among the Top 5: It goes out of its way to help customers, digging up out-of-stock equipment to help maintain the Hewlett-Packard Co. and Compaq Computer Corp. environment at Merle Norman Cosmetics in Los Angeles. "Every time there's a special order we need, like a driver for an older printer, they will take extra steps to get it for us," said Marty Campman, network supervisor at Merle Norman.

A successful reseller must have basic practices down to a science. "These Top 5 companies do a very good job at the basics. They are the ones who are winning now, and we think they will win in the next five years," said Joe Pucciarelli, research director of IT asset management at Gartner Group, Inc. in Stamford, Conn.

A good grip on the fundamentals can also lead to systems integration services.

For example, Money Store, Inc. in Sacramento, Calif., chose AmeriData Technologies, Inc. (now part of GE Capital) for a rollout of NT only because the firm is a Microsoft Solutions Provider. But that basic Microsoft Corp. installation led to providing a corporatewide solution streamlining connectivity to an AS/400 via an SNA gateway.

AmeriData recommended, installed, piloted and prototyped the SNA gateway, said Becky Wanta, information technology vice president at the Money Store. "Their VAR side is good to have, but what I really need is the services they provide," she said.

Once its technical abilities are proven, a provider must possess good people skills in order to be successful. No. 2 Inacom Corp. seems to do that. "They are dedicated and attentive," said Russell Pearson, systems analyst at the Oregon Department of Justice in Salem, Ore. Inacom provided legacy connectivity between the Justice Department's Banyan Systems, Inc. Vines clients and its Wang Laboratories, Inc. SNA environment.

USConnect, Inc. (19 of its 26 reseller/integrator affiliates were recently acquired by Ikon Technology Services), for example, appears to be good at responding to customers. "They are very good at getting back to me, good at immediate feedback. It's usually within 48 hours," said Joyce Cutlip, information systems director at Wilmer, Cutler & Pickering, an international law firm in Washington.

Cutlip used USConnect/Ikon for a Windows 95 rollout across 600 different systems corporatewide. She said she has used the company more as an integrator than as a value-added reseller (VAR).

Cutlip has also remained loyal to USConnect because the company treats its own staff well and has a history of low turnover.

A stable, talented staff is important to end users because most of them are resource-constrained and looking to outtask services, Pucciarelli said.

But resellers turned integrators must not do too much. They must stick to what they are good at. AmeriData, for example, developed strengths in AS/400, SNA and Windows NT integration.

But specialties will shift in this market of mergers and acquisitions. "It's an industry that will go through additional consolidation," Pucciarelli said.

The staff turnover that accompanies consolidations can cause users to suffer. For example, Entex Information Services, Inc. in Rye Brook, N.Y., acquired two VARs: Random Access, Inc. in September 1995, which had just acquired another VAR called JLV. "Everything was great until the acquisitions. Then our sales rep changed three times in three months, and everybody who was working on our project resigned," said Rick Tuggle, vice president of IS at Union Bank and Trust in Denver. However, Entex was very accommodating in settling the situation, Tuggle added.

	Overall Satisfaction	Business Practice	Project Management	Technical Performance
1.	MicroAge, Inc.	MicroAge, Inc.	MicroAge, Inc.	MicroAge, Inc.
2.	Inacom Corp.	Inacom Corp.	Inacom Corp.	Inacom Corp.
3.	AmeriData Technologies*	USConnect, Inc.	AmeriData Technologies	USConnect, Inc.
4.	USConnect, Inc.**	AmeriData Technologies	USConnect, Inc.	AmeriData Technologies
5.	Entex Information Services	Entex Information Services	Entex Information Services	Entex Information Services

Source: Computerworld

The introduction of channel assembly is yet another addition of services. Some resellers now perform the final assembly of PCs in-house instead of leaving it to the manufacturer or assembling equipment at the customer site and selling through other smaller VARs. MicroAge did $2 billion worth of business in 1996 as a distributor, or aggregator, to resellers. The Integration Group made another $1.4 billion in 1996 by serving Fortune 1,000 customers, for which MicroAge provides services such as asset management, help desk and procurement.

"To be successful as a [reseller/integrator] today, you need to be more than just a box company. You need to provide quality support services," Pucciarelli said.

Gerber is a freelance writer in Kingston, N.Y.

SYSTEMS INTEGRATORS

Upping the ANTE

Resellers move upstream with a broader range of integration services

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Satisfaction Rankings of Resellers/Integrators

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Source: *Computerworld*

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MEGA

No longer a quick fix for companies under duress, outsourcing is being embraced by healthy outfits, making for bigger and bigger deals

LIKE A SOCIETY MATRON who appears at the grand opera in last year's gown, companies outsourcing their information systems in the late '80s or early '90s were thought to be in some degree of financial distress. It might be a bank, such as Continental Bank of Chicago, that was in immediate need of a few hundred million dollars in extra cash. Often, it was a recession-torn manufacturer that saw in outsourcing one of the less painful, more acceptable ways of lightening its payroll.

Before long, outsourcing had become a big stick to wield quietly in the executive suite: Bosses merely had to whisper the name "EDS," the joke went, and their information technology managers would snap into humble obedience.

And if big outsourcing deals were mainly for invalid companies, it seemed logical that the number and size of such deals would diminish over time. After all, there were only so many troubled companies that could benefit from selling off their mainframe data centers in such transactions. And as the recession abated and profits returned, there'd be even less incentive to farm out entire computing departments. Computing, after all, was "strategic," the supposed key to virtually every company's future, and what CEO in his right mind was going to hand over something that important to an outsider? No, common wisdom held, giant outsourcing deals were like the dinosaurs, doomed by inexorable shifts in the overall business environment.

Guess what? Not only have these dinosaurs survived, but they're also thriving — and with no help from Michael Crichton or Steven Spielberg.

So-called "megadeal" outsourcing contracts, which can include anything from applications development to data center and network management, are not only growing in number but also getting more mega by the minute. Dollar values seem to increase every time a supplier and client shake hands over a new pact. And the companies signing these deals are rarely in trouble, financially or otherwise. No, the outsourcing business is climbing to a new level of maturity and sophistication, and that's having major implications for systems integrators and clients alike.

"The boom is broadening," said Stephen McClellan, a computer industry analyst at Merrill Lynch & Co. "Every CEO is paying attention now because there's a parade of bigger and bigger [corporate] names involved."

Bigger, indeed, and they're doing more innovative deals:

- Swiss Bank Corp. signs up Perot Systems Corp. for $250 million a year to run major parts of its worldwide IT operations for at least 10 years. To solidify the relationship, Swiss Bank takes a stake in Perot, not to exceed 24% of the privately held services company over time.
- Chemical giant DuPont Co. contracts with Andersen Consulting and Computer Sciences Corp. (CSC) at $4 billion-plus for 10 years of services. It plans to measure their success in terms of improved value for DuPont shareholders.
- J. P. Morgan & Co. agrees to pay a hand-picked quartet of outsourcers — Andersen, CSC, AT&T and Bell Atlantic Corp. — as much as $2 billion to run its computers, manage its networks and build new applications over the next seven years.
- Ryder System, Inc. gets Andersen and IBM to split a $1.4 billion contract to help it with computing over the next 10 years. They'll share their expertise in designing new systems for logistics.

Not that large-scale outsourcing is suddenly 100% risk-free, especially as more deals aim to create new products and services from which partners are to jointly profit. A key ingredient in every contract remains the escape clause, which has allowed firms such as Mutual of New York (MONY) and Delta Air Lines to back out and bring IT in-house.

What's driving all this mega activity? Clearly, clients' goals for these recent supercontracts are radically different from those signed in the late '80s and early '90s. Back then, clients were generally trying to extricate themselves from some kind of immediate trouble: a lack of cash or excessive operating costs, most often. Today, they're more likely to be avoiding trouble far down the road — to prepare for the future instead of fixing past mistakes.

"When technology was concentrated in the back office, cost savings were paramount" for clients, said H. Ronald Nash, vice president in charge of outsourcing at Perot Systems in Dallas. "Now technology's moving into the front office to help with marketing and customer service. It's an offensive weapon. If I reach more customers, who cares if I spend more on technology, not less? And so the lid comes off the number of deals you can do."

No doubt, cost savings remain a big part of outsourcing's allure. Ryder, for instance, expects to save about $160 million in IT costs over the course of its planned 10-year relationship with IBM and Andersen. DuPont is counting on reducing its spending on IS by as much as 10% through its 10-year partnership with Andersen and CSC. Hardly small change, particularly at a company that has slashed its computing budget by 40% during the past three years, to $690 million a year. Now the

DEALS march on

By John W. Verity

plan is for CSC to take over 13 data centers and hire 2,600 of DuPont's 4,200 data processing employees while Andersen hires another 500.

But now, more pressing than simply improving the balance sheet and fixing mainframe-related costs are more purely technological and business issues. Corporations are recognizing that digital technologies are mutating and evolving too fast and in too many directions at once for their own technical staffs to ever keep up.

Technical expertise and seasoned experience are scarce, especially in fields such as large-scale TCP/IP networking, object-oriented programming, data warehouse design and electronic commerce. Hiring good talent full time is usually out of the question. Ditto for training current employees, who are likely to leave and sell their new skills on the open market for as high a price as possible.

"Folks are having a difficult time attracting quality IT talent. Why not let someone else keep up with technology?" asked Ronald L. Lacy, vice president of finance at Technology Partners, Inc., a Houston-based consulting firm that helps clients negotiate outsourcing contracts. In theory, Lacy said, outsourcers can better afford to stay abreast of technical trends because they can amortize costly skills across many different projects.

Past megadeals generally saw clients hand over to outsourcers the core set of computing activities. But in 1994, Xerox Corp. started what has become an increasingly popular trend. It signed a $3.2 billion contract under which Electronic Data Systems Corp. would, yes, take over its global mainframe-related operations for 10 years. But that was partly a way to let a remaining Xerox IT staff of 700 work on moving the copier giant swiftly into the kind of flexible network computing it would need to compete effectively over the long term. Key to this was a thorough re-engineering of Xerox's software development processes, based on an object-based architecture that will rationalize and improve software activities around the world.

"Xerox wants to create the IT organization of the future," said Jagdish R. Dalal, then Xerox's vice president of information management and now a partner at Price Waterhouse Consulting.

DuPont started down a somewhat different route late last year, building what its executives insist is more a "partnership" than a traditional outsourcing setup. Either way, it's one of the most innovative and complex megadeals yet, industry observers say. CSC and Andersen will develop the usual new financial and industry-specific applications for DuPont's use, largely centered around SAP AG's popular R/3 software package. But all three companies will also depend on and work closely with one another in ways not seen before.

DuPont, for instance, is holding on to 1,100 of its 4,200 IT workers just to manage the contracts and joint projects it undertakes with the others. All three, meanwhile, will work on products and services that may be sold elsewhere in the chemical and energy industries — at first, to DuPont's own subsidiaries in other countries. DuPont's overarching goal, its executives state, is to make sure that all three will share both risks and profits.

Such mutually beneficial setups are catching on widely among the megadealers. CSC is working with CNA Insurance, a major outsourcing client, to create a new business entity that will sell business process consulting services to other insurance firms. Bell Canada plans to work in similar fashion in the telecommunications industry with IBM Canada's ISM outsourcing unit. And as part of its deal with Swiss Bank, Perot Systems plans to eventually create applications that could be sold to other financial institutions.

EMPHASIS ON VALUE

Perhaps the biggest news in IT outsourcing today, though, is the idea of "value pricing" — "a tidal wave of a trend," Perot Systems' Nash called it. He estimated that two-thirds of the companies negotiating large IT outsourcing deals right now are seeking to have their contractor's compensation tied explicitly to the amount of value that company actually delivers (see column page S8). The value may be measured in terms of how well a certain business process improves, for instance, or how much extra revenue or profit the jointly developed products or services generate. In DuPont's case, fees are proportional to measurable improvements in shareholder value.

Coming up with a formula for computing that value "gets ticklish," Nash said. It's not always clear how much influence each side has on something as squishy as "customer service." Increasingly, though, hammering out "service-level agreements" is a major point of discussion at negotiating tables.

All of this shows that "end users are getting smarter," said Suzanne Kurad, project leader at G2 Research, Inc. in Mountain View, Calif. They want outsourcing to improve entire functions of their businesses (see story page S13), not simply take cost out of data centers or have better maintenance for their PCs and communications networks. And that means setting up more sophisticated outsourcing arrangements, which increasingly involve not one but several major "best of breed" contractors. Each is selected for its expertise in a particular technical or business-related field.

Pioneering this trend has been J. P. Morgan, the white-shoe investment bank. Although it has long been viewed by rivals as one of Wall Street's most aggressive users of digital computing, Morgan surprised many of them a year ago when it reached out to a hand-picked team for a broad menu of ser-

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ILLUSTRATIONS JAMES YANG

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vices: CSC, Andersen, AT&T and Bell Atlantic. Their respective missions: run the bank's legacy systems, build new applications, manage its far-flung communications network and maintain its distributed systems.

Although the latter three companies are legally subcontractors to CSC, the seven-year deal is structured in a way that rewards all four members of this so-called Pinnacle Alliance for cooperating with one another in Morgan's best interests.

Morgan recently said the outsourcing arrangement is hitting its 15% annual cost savings target, though the four partners have a ways to go to keep up with the rate of change on Wall Street [CW, June 30].

Demand for this kind of specialized package of services presents a major challenge to suppliers. Suddenly, strict IT-only services — running data centers and networks, for instance — seem destined to devolve into price-sensitive, low-profit commodities. The bigger profits, suppliers realize, will be in high-concept services such as redesigning business processes (especially for companies in specific industries) and building the new software needed to support those processes.

"EDS and CSC want to secure themselves a pretty good cushion," said William Martorelli, vice president at Giga Information Group. "It's troubling them that Andersen Consulting, for instance, is getting hired for so much high-impact, high-margin process design work. The big question for these companies is, who's going to take the high ground?"

So these suppliers are scrambling to boost their internal expertise and line up strategic partners: EDS in 1995 acquired A. T. Kearney, a well-established management consulting firm whose business is now growing by some 40% a year. IBM has been building its own management consulting practice since the early '90s. CSC has owned consulting firm Index Systems since the mid-1980s, and last year it bought Continuum, a specialist in software for insurance companies. It has also aligned itself with CNA.

And yet, for all the evidence of bigger and strikingly new types of megadeals, how successful they'll be is still a matter of some dispute. Some have already gone sour, quite publicly: Last May, CSC lost a seven-year, $210 million outsourcing deal signed in 1994 with life insurer MONY. The two firms had originally planned to jointly supply services to other insurers, but MONY perceived the Continuum acquisition as a conflict. And sources close to the two companies say CSC failed to deliver significant chunks of software it had promised. MONY has decided to back 250 staffers from CSC, add 30 new employees and go back to building its own systems.

For clients, success depends first on negotiating the right deal and then on effectively managing the outsourcing relationship. Dean E. Davison, senior research analyst at Meta Group, Inc., said outsourcing "vendors don't have any magic fairy dust." So as outsourcing deals get bigger, more complex and more ambitious, clients just have to pay more attention to what they're getting for their money.

Verity is a freelance writer in New York.

The Big Get Bigger

Billion-dollar outsourcing deals are becoming more and more the norm

1994

- EDS: Xerox, $3.2B
- CSC: British Aerospace, $1.5B
- EDS: Lufthansa, $833M
- IBM: Air Canada, $583M
- IBM: AmTrack, $509M
- IBM: Philadelphia Electric, $450M
- CSC: Scott Paper, $300M

Total: $7.38B

1995

- EDS: Dutch Nat'l Railroad, $1.8B
- CSC: Hughes Aircraft, $1.3B
- EDS: UK Soc. Sec. Agency, $1B
- EDS: Rolls-Royce Aerospace, $1B
- EDS: BTI Americas, $900M
- CSC: Lucas Industries, $750M
- CSC: Anglian Water UK, $300M

Total: $7.05B

1996

- IBM: Lucent Technologies, $6.2B
- CSC: DuPont, $4B
- IBM: Ameritech, $4B
- CSC: CNA, $2B
- CSC: J. P. Morgan, $2B*
- EDS: GM Plant Floor, $1B
- IBM: Metra Healthcare CA, $540M
- IBM: Washington Mutual, $533M
- IBM: La Caixa, $500M
- IBM: Pacific Bell, $400M
- CSC: ING Financial Svcs., $250M

Total: $21.4B

*CSC is lead member of outsourcing team

Source: Merrill Lynch & Co.

EXPERTS

Need Only Apply

By Thomas Hoffman

More and more firms are tapping integrators to run computationally intensive business functions

What began quietly as an innocent foray into payroll processing when President Truman was in office is today a raging multibillion-dollar business that spans multiple organizational functions.

It's called business process outsourcing (BPO), and it dates back to 1949 when Automated Data Processing, Inc. in Roseland, N.J., began processing paychecks for outside companies. The re-engineering craze of the early 1990s breathed life into BPO by advocating that companies shed creaky old business models, including non-mission-critical operations, so they could focus on core competencies.

That was true at British Petroleum PLC, which began outsourcing its UK accounting functions to Andersen Consulting LLP in 1991 to manage costs more effectively, said Alan Eilles, vice president of business development at BP Exploration in Houston.

The move has helped BP slash its UK-based accounting costs 35% to 40%, with projections of knocking down its U.S. accounting overhead some 25% to 30% within the next three years, said Eilles, who manages a 10-year, $120 million outsourcing arrangement between Andersen and five BP business units in the U.S.

BP's savings were achieved and are in line with expectations, in large part because Andersen has more know-how than BP about operating accounting systems more cheaply and efficiently, Eilles said. As a systems integrator and accounting expert, Andersen has a better handle on the technologies that can be used to drive costs out of the accounting process, Eilles added.

Vendors such as Andersen, he said, "can deliver a better service to us at a lower price" because they have more accounting expertise and a more

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CUSTOMER SERVICE WITH A SMILE

For many companies, the decision whether to outsource a close-vested business function such as customer service is a toughie.

For DirecTV, Inc., it was a no-brainer.

When Hughes Electronics formed the direct satellite system unit in 1990, the group consisted of "only four or five people, and we realized that we couldn't meet our launch time frame [of June 1994] without help," said Larry Driscoll, senior vice president of customer service at DirecTV in El Segundo, Calif.

So DirecTV began searching for a vendor to handle customer service. It contacted the Top 10 telemarketing and customer service players in the U.S., as rated by *Telemarketing Magazine*. DirecTV wanted a "dedicated" operation for its service, Driscoll said. "We didn't want a customer service representative who would take an order for a Glenn Frey and then field a call for one of our customers," he explained.

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DirecTV set up site visits with potential vendors and eventually chose Matrixx, a customer service outsourcing vendor and a subsidiary of Cincinnati Bell, Inc. The value of the deal: $150 million annually, including people, technology, call centers and telecom costs, analysts said. "We didn't know what the direct TV business would be like since we hadn't done it before, and we knew we'd have to make a lot of changes" on the fly with a partner willing to be accommodating, Driscoll said.

Turns out DirecTV made even more changes during its start-up days than it had anticipated. Because the Direct Satellite Service (DSS) market was new, 40% of the call volume in the first four months was so-called prospect calls, where customers called for technical information about how the service worked.

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After launching its satellite service with a 25-person customer service staff, DirecTV added 100 reps a week during the 1994 holiday season to meet customer demand, Driscoll said. DirecTV and Matrixx have since added a customer service center in Cincinnati and plan to open a third in Oklahoma City by the end of this month. Matrixx now has 2,500 dedicated customer service reps in place to support DirecTV.

To support DirecTV, Matrixx developed an in-house, three-tier client/server customer service system called Alta. DOS-based clients use a remote messaging system to communicate with server processes on a Tandem Computers, Inc. host, which provides database access and business services to the client. This system includes call history recording and a scripting engine that lets DirecTV customize telemarketing scripts. Alta runs in four call centers, each accessing the host over a wide-area network via TCP/IP or NetBIOS. Each center's Northern Telecom, Inc. Meridian 1 phone switch is connected to the Tandem host to provide screen "pops" with customer data when customers are connected.

By outsourcing customer service, DirecTV avoided the up-front investments in capital expenses and facilities. Driscoll said DirecTV would not likely bring customer service in-house — it would have to quadruple human resources just to solve its customer service group. That stops with the kinds of overhead cost savings other BPO customers have achieved. Labor typically comprises two-thirds of call center costs, and companies that outsource this function often slash their costs 10% to 30%, said Christine Mayers, an analyst at Gz Research, Inc. in Mountain View, Calif.

"If I looked at the absolute numbers, we might save a little bit of money if we did [customer service] internally," Driscoll said. "But we feel the level of service they provide is worth what ends up being a reasonable profit margin for Matrixx."

CONTINUED FROM PAGE S11

vices CSC, Andersen, AT&T and Bell Atlantic. Their respective missions run the bank's legacy systems, build new applications, manage its far-flung communications network and maintain its distributed systems.

Although the latter three companies are legally subcontractors to CSC, the seven-year deal is structured in a way that rewards all four members of this so-called Pinnacle Alliance for cooperating with one another in Morgan's best interests.

Morgan recently said the outsourcing arrangement is hitting its 15% annual cost savings target, though the four partners have a ways to go to keep up with the rate of change on Wall Street (CW, June 30).

Demand for this kind of specialized package of services presents a major challenge to suppliers. Suddenly, strict IT-only services — running data centers and networks, for instance — seem destined to devolve into price-sensitive, low-profit commodities. The bigger profits, suppliers realize, will be in high-concept services such as redesigning business processes (especially for companies in specific industries) and building the new software needed to support those processes.

"EDS and CSC want to secure themselves a pretty good cushion," said William Martorelli, vice president at Giga Information Group. "It's troubling them that Andersen Consulting, for instance, is getting hired for so much high-impact, high-margin process design work. The big question for these companies is, who's going to take the high ground?"

So these suppliers are scrambling to boost their internal expertise and line up strategic partners. EDS in 1995 acquired A. T. Kearney, a well-established management consulting firm whose business is now growing by some 40% a year. IBM has been building its own management consulting practice since the early '90s. CSC has owned consulting firm Index Systems since the mid-1980s, and last year it bought Continuum, a specialist in software for insurance companies. It has also aligned itself with CNA.

And yet, for all the evidence of bigger and strikingly new types of megadeals, how successful they'll be is still a matter of some dispute. Some have already gone sour, quite publicly. Last May, CSC lost a seven-year, $210 million outsourcing deal signed in 1994 with life insurer MONY. The two firms had originally planned to jointly supply services to other insurers, but MONY perceived the Continuum acquisition as a conflict. And sources close to the two companies say CSC failed to deliver significant chunks of software it had promised. MONY has decided to back 250 staffers from CSC, add 30 new employees and go back to building its own systems.

For clients, success depends first on negotiating the right deal and then on effectively managing the outsourcing relationship. Dean E. Davison, senior research analyst at Meta Group, Inc., said outsourcing "vendors don't have any magic fairy dust." So as outsourcing deals get bigger, more complex and more ambitious, clients just have to pay more attention to what they're getting for their money.

Verity is a freelance writer in New York.

The Big Get Bigger

Billion-dollar outsourcing deals are becoming more and more the norm

1994

- EDS: Xerox, $3.2B
- CSC: British Aerospace, $1.5B
- EDS: Lufthansa, $833M
- IBM: Air Canada, $583M
- IBM: AmTrack, $509M
- IBM: Philadelphia Electric, $450M
- CSC: Scott Paper, $300M

Total: $7.38B

1995

- EDS: Dutch Nat'l Railroad, $1.8B
- CSC: Hughes Aircraft, $1.3B
- EDS: UK Soc. Sec. Agency, $1B
- EDS: Rolls-Royce Aerospace, $1B
- EDS: BTI Americas, $900M
- CSC: Lucas Industries, $750M
- CSC: Anglian Water UK, $300M

Total: $7.05B

1996

- IBM: Lucent Technologies, $6.2B
- CSC: DuPont, $4B
- IBM: Ameritech, $4B
- CSC: CNA, $2B
- CSC: J. P. Morgan, $2B*
- EDS: GM Plant Floor, $1B
- IBM: Metra Healthcare CA, $540M
- IBM: Washington Mutual, $533M
- EDS: La Caixa, $500M
- IBM: Pacific Bell, $400M
- CSC: ING Financial Svcs., $250M

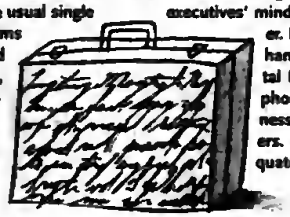
Total: $21.4B

*CSC is lead member of outsourcing team

Source: Merrill Lynch & Co.

MORE THAN A KODAK MOMENT

In 1989, Eastman Kodak Co. signed what's now considered to be the first megadeal ever — a seminal event in IT outsourcing's brief but pyrotechnic history. Kodak not only outsourced everything from mainframe operations to telecom networks and desktop computing but it also chose three different companies to help out, not the usual single outsourcer. Soon, a flood of other firms were inspired to sign similarly large and comprehensive outsourcing contracts, causing observers such as Mary C. Lacity, assistant professor of MIS at the University of Missouri in St. Louis and author of several books about IT outsourcing, to identify "the Kodak effect."



But was that original megadeal itself a success? Evidently, the answer is yes. A great deal has changed since Kodak signed the deal — in the computer business, at Kodak and in its specific outsourcing arrangements. "A horse or two got changed, but the race is still on," said George A. Logemann, formerly at Kodak and now director of outsourcing consulting at The Yankee Group. "It still makes sense to do deals like this."

Kodak declined to make executives available for comment. "Our experience has shown that the outsourcing decision was very successful and in the ways that we were looking for — namely, in pushing the state of the art and reducing our cost base," a spokesman said.

Outsiders, though, are more talkative. Kodak, they point out, seems to have overcome internal and external events that might have changed less committed executives' minds about IT outsourcing altogether. For instance, Kodak chose IBM to handle mainframe computing, Digital Equipment Corp. to run Kodak's phone and data networks and Businessland to tend to desktop computers. Eventually, Digital proved inadequate for the job, and Kodak turned over its networking to an alliance between Northern Telecom and IBM. Similarly, a series of sales and acquisitions eventually transformed Businessland into Entex Information Systems.

Another potential problem: Kodak's outsourcing contract was amazingly concise at just 12 pages plus some appendices.

That contract's compactness, though, may have fooled some other companies into ignoring the importance of writing a complete contract. Lacity, among others, said she believes Kodak benefited a good deal from IBM's newly formed ISSC outsourcing arm wanting to impress other potential customers by ensuring its work with Kodak was a success.

"Other companies [following Kodak's lead] ran into big problems," although not necessarily with ISSC, Lacity said. "Service levels weren't defined. And often there was no shared risk and reward. This was not something that could be replicated."

"Customers like to use the rhetoric of 'partnering,' but few of them really achieve that," she said. What's especially important is that both companies bring a certain strength of their own to the partnership.

Kodak's strength in 1988 may have been simply a dire need to get its own house in order. The Rochester, N.Y., company had largely neglected its core photo business, which had come under siege from Japan's Fuji Corp., and its overly ambitious diversification strategy had run aground. As a result, Kodak was bleeding red ink. Yet even as corporate profits were falling, Kodak's IT budget was still rising and "completely out of whack," said Stanley J. Goldman, president and CEO of Technology & Business Integrators, a consulting firm in Woodcliff Lake, N.J. And in that regard, Kodak was hardly alone.

Indeed, looking back on corporate America's financial suffering in the late '80s, it appears as if the rush to mega outsourcing deals was inevitable. Goldman said, "A Kodak had to happen."

SYSTEMS INTEGRATORS

EXPERTS

Need Only Apply

By Thomas Hoffman

What began quietly as an innocent foray into payroll processing when President Truman was in office is today a raging multibillion-dollar business that spans multiple organizational functions.

It's called business process outsourcing (BPO), and it dates back to 1949 when Automated Data Processing, Inc. in Roseland, N.J., began processing paychecks for outside companies. The re-engineering craze of the early 1990s breathed life into BPO by advocating that companies shed creaky old business models, including non-mission-critical operations, so they could focus on core competencies.

That was true at British Petroleum PLC, which began outsourcing its UK accounting functions to Andersen Consulting LLP in 1991 to manage costs more effectively, said Alan Eilles, vice president of business development at BP Exploration in Houston.

The move has helped BP slash its UK-based accounting costs 35% to 40%, with projections of knocking down its U.S. accounting overhead some 25% to 30% within the next three years, said Eilles, who manages a 10-year, $120 million outsourcing arrangement between Andersen and five BP business units in the U.S.

BP's savings were achieved and are in line with expectations, in large part because Andersen has more know-how than BP about operating accounting systems more cheaply and efficiently, Eilles said. As a systems integrator and accounting expert, Andersen has a better handle on the technologies that can be used to drive costs out of the accounting process, Eilles added.

Vendors such as Andersen, he said, "can deliver a better service to us at a lower price" because they have more accounting expertise and a more

Experts, page S14

More and more firms are tapping integrators to run computationally intensive business functions

CUSTOMER SERVICE WITH A SMILE

For many companies, the decision whether to outsource a close-vested business function such as customer service is a toughie.

For DirecTV, Inc., it was a no-brainer.

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JOHN BAXTER/ACME DESIGN CO

Continued from page S13

critical mass of people and systems than BP.

Perhaps that helps explain why the BPO market is expected to nearly double from a $168 billion industry today to $330 billion by the year 2001, according to G2 Research, Inc. in Mountain View, Calif.

The market is ripe for the types of mundane, transaction-oriented tasks that organizations can off-load to integrators with more expertise and critical mass in fields such as payroll. There's an even stronger business case for start-up companies that lack an infrastructure to support functions such as core financials (accounts payable, receivables, payroll, etc.) and that are looking to reduce their time to market, as DirecTV, Inc. did when it handed off customer service to Matrixx Marketing, Inc. in Cincinnati to support the 1994 launch of its nationwide direct satellite TV services (see story page S13 and diagram above).

But with so many companies and industries focused on being "customer-centric," certain companies such as specialty retailers are unlikely to hand over customer service support to a third party, especially if that vendor fields calls and gathers data for that retailer's competitors.

Computer Sciences Corp.'s (CSC) insurance industry customers have "heavy" contractual protection against competitive information outflow through legal representations and warranties that CSC is bound to, said Jackie Van Erp, vice president of integrated business services for CSC in Austin, Texas. CSC manages 2 million life insurance policies for 20 insurers, including 1 million policies for CNA Financial Cos. in Chicago.

Of course, the decision whether to outsource customer service varies from company to company. Some organizations see this type of outsourcing as an opportunity to take advantage of a specialist's state-of-the-art call center, said Keiron Lynch, a vice president at Mellon Bank who's responsible for the Pittsburgh-based bank's recent (May '97) foray into global cash management services with MCI Systemhouse.

Other companies that have spent thousands of dollars and years of training on customer service representatives would be a lot more reluctant to suddenly turn that function over to another company, Lynch said.

One thing that's becoming increasingly evident is that BPO isn't a cut-and-dried decision. Some vendors will have you believe that anything and everything is up for grabs, while others admit that it makes sense for customers to retain strategic functions in-house.

For example, even though brokerages have historically been tight-fisted about even commodity-type functions, such as securities clearance, "everything is [now] fair game" for outsourcing, as brokerages look to lower their costs in an industry that's undergoing rapid disintermediation, said Stephen G. Racioppo, regional managing partner for financial services at Andersen Consulting's Northeast practice in New York.

But even BP would be unwilling to outsource tax management — widely viewed as a commodity function by those companies that outsource that function to Big Six accounting firms — because BP's staff has developed expertise in local geographies and tax codes, said John Cross, general manager of information technology at BP in Hertfordshire, UK.

GROWING CAN BE HARD TO DO

BPO pioneers are experiencing many of the same kinds of growing pains that their information technology predecessors had to deal with, such as underestimating demand for services and learning how to structure results-driven or "gain sharing" contracts (see column page S8).

For example, when CoreStates Financial Corp outsourced its payroll operations in January 1996 to Genesys Software Systems, Inc. in Methuen, Mass., contract pricing was "very headcount-related," said Anne Clifford, vice president of human resources and IT at the Philadelphia-based bank.

Problem is, that model doesn't map with CoreStates' ongoing restructuring in the acquisition-intensive banking industry, Clifford said. "In an institution our size with our merger activities and re-engineering," the contract parameters became "an administrative burden" for both CoreStates and Genesys, said Clifford, who is otherwise satisfied with Genesys' settlement and transaction processing support.

That's why CoreStates is "completely reevaluating" its human resources outsourcing deal and has reopened the bidding to Genesys and other competitors such as ADP and Ceridian Corp. on a performance-based contract (e.g., whether it took a CoreStates employee 30 seconds or five minutes to reach someone in human resources). "We had a lot of learning to do at the beginning, but we still believe outsourcing was the right decision," Clifford said. She said she expects to narrow the field of five down to two candidates this month. "I don't want payroll back," she added.

Hoffman is a Computerworld *senior news editor, IS management.*

WEB WIZARDS

The new breed of integrator is smaller and focused on Internet technologies. The problem is, there are so many. So how do you find one who's any good?

By Rochelle G[illegible]

MARK ALCORN

CHRISTOPHER DENISCO had had his fill of fancy-schmanzy consultants. You know, those Big Names that come in promising top-notch skills but instead deliver wet-eared, arrogant little snots who don't have the experience not to screw things up. So when the time came to revamp the business at SND Electronics, Inc. using Internet technology, he went looking for some fresh blood and new minds.

He chose Nubium Technology Group Ltd. in Newton, Mass. "We are a medium-size company that couldn't get the time of day from those Big Six firms," said DeNisco, president of the Greenwich, Conn., electronics components distributor. "When you look at Nubium's resumés, you see they're the cream of the crop. [The owners defected from highly regarded Cambridge Technology Partners.] And that means a company my size gets the opportunity to deal directly with the owners when we have a problem."

Access to the owners! Consultants with years of experience! No wonder DeNisco appreciates Nubium's services. And not just for the technology ingredients. Yes, Nubium moved SND away from Unix and onto Windows NT. And sure, it created an intranet-based workflow system that connects all of SND's sales, accounts and fulfillment people throughout the world. Total cost: $750,000, $300,000 of which was just in consulting fees. But what's intriguing is that this 20-person integration house did that after first engaging in classic business process re-engineering — the hallmark of such top-tier firms as Andersen Consulting, KPMG Peat Marwick and Ernst & Young. "Nubium didn't automate what we do; they helped us rethink what we do," DeNisco said.

It's the new breed of systems integrator: Smaller. Focused on Internet technologies. Generally working on a fixed-time, fixed-price fee schedule. Able to apply new ways of thinking to how technology can further its customers' business.

There's just one problem. So many have entered the Web integration business that it's hard to find out who's any good.

"I would really question how capable the smaller firms are at doing large e-commerce types of applications that transform your business," said Bonnie Digrius, vice president of the IT management division at Gartner Group, Inc. in Stamford, Conn. "Such projects demand more than technical skills. They entail skills like project management, change management and understanding cultural issues. These skills are expensive and in short supply."

In such short supply, in fact, that even the largest systems integrators are having trouble finding qualified bodies. That's why, in a March 1997 Research Note on consultants and integrator firms, Digrius ranked only five out of 18 of the *leading* companies as "strong." And where do the Web-focused integrators fit in? Digrius admitted they're not even on her radar.

But when Digrius rated integrators, she focused on how well each handled projects with varying degrees of complexity, from level one through three, with level three building mission-critical applications for a competitive edge. The key is the use of "mission-critical" as a salient ingredient in choosing an integrator. Another is price because many integrators just won't touch a project that costs less than $1 million. You won't find the more focused integrators so choosy. Their sweet spot, in fact, is projects that cost between $100,000 and $1 million. And a third point is creativity.

All of those factors helped Technology Funding, Inc. in San Mateo, Calif., choose US Web Utopia for its new Web site. No, it's not mission-critical. But the project, expected to cost $500,000 over the next year, did require a new slant on business as the venture capital group attempts to improve communications with its clients yet reduce marketing and customer service expenses. "They help you think out of the box," said Ellen Brodbine, director of communications. "We chose Utopia, even though they're based out of Boston, because of their combination of skills in marketing, business and technology."

Confused? On the one hand, analysts say such smaller firms don't possess these skills, yet customers say they do. The answer may lie in who these integrators hire: themselves. Instead of hiring smart, young MBAs fresh out of school, the small yet more credible shops staff their operations with partners adept at business process re-engineering, change management, project management and coding. "When I talk to my client, I have a long-term stake in the success of that business," said Ken Smith, senior strategy and marketing consultant at US Web Utopia, one of the family of affiliates that have joined with US Web in Santa Clara, Calif., to pool research, expertise and evaluation services like those found in big firms.

Clearly, no firm has enough consultants skilled in applying cutting-edge technology to business transformation. The requisite Internet skills are so rare, the big guys can be caught just as short as a boutique shop. But remember, we're dealing with Internet time. What holds true today will doubtless be passe in a few months.

Garner is a freelance writer in San Carlos, Calif.

INTEGRATION

Interruption *or* Opportunity?

By Steve Ulfelder

A PUNCH CARD IS WORTH A THOUSAND WORDS.

Scott Atkins, national director of Year 2000 services at Coopers & Lybrand LLC, said one of the problems his people face when beginning a conversion engagement is the "inordinate amount of time spent explaining the predicament." He knows of some enterprising chief information officers who have gone to board meetings with punch cards in hand to convey an idea of how the problem started.

"They hold it up and tell the other executives, 'See, this is what they had to work with, and here's the date field, and here's how many digits they put in.' "

The word "denial" comes up a lot when systems integrators discuss the Year 2000 problem. Despite all the dire predictions, a shocking number of very large information systems organizations either have not addressed the issue at all or are just stepping up now.

Bert Russo, vice president of legacy management services at Computer Sciences Corp., headquartered in El Segundo, Calif., said, "We're working with a major — I mean, major — financial institution. They said just yesterday, 'You know, it's starting to dawn on us how big this problem might be.' They're in denial."

Denial is a luxury that systems integrators themselves cannot afford. Their computer use is so vast and intensive that they must tend their own Year 2000 house, both to mollify investors (in the case of systems integrators that are publicly traded) and to prove to clients that they can walk the walk.

Electronic Data Systems Corp. (EDS) is an example. The Plano, Texas-based services firm has 9,000 clients and a vast number of systems; it stands to reason that its Year 2000 fix would be expensive and complex. Analysts heavily pressured EDS to divulge the extent of its problem. In May, EDS released the numbers: The company is looking at a $144 million tab over the next three years.

Few systems integrators have followed EDS in publicly announcing their own conversion expenses. Tarun Chandra, vice president of technology research at New York investment bank Punk, Ziegel & Co., follows the information technology services industry. He calls most integrators "tight-lipped."

"They're examining their own exposure," Chandra said, "and from there they determine how much new [Year 2000] business they can go after."

At first glance, there's plenty to go after. Unlike most information systems organizations, which must simply eat the Year 2000 conversion cost to stay in business, systems integrators can point to some black ink as well. Make that lots of black ink. At the same time it announced that $144 million conversion price tag, EDS predicted it will see $1.3 billion in new conversion business.

Punk, Ziegel estimated that the Year 2000 conversion will generate $80 billion in overall worldwide business. That amount includes both tools and services, with the latter accounting for the "overwhelming bulk" of the business, Chandra said. Of this services money, he forecast an even split between large systems integrators and smaller, more specialized outfits such as Mountain Lakes, N.J.-based Computer Horizons Corp. and Boston-based Keane, Inc.

BACKDOOR OPPORTUNITY

But $80 billion doesn't go as far as you might think. Of its anticipated $1.3 billion in conversion revenue, EDS expects only $200 million to $250 million in profit over the three-year span. That's short money for a behemoth such as EDS, and it illustrates the approach many systems integrators are taking to the date change: It's an expected customer service and a way to maintain a strong relationship with clients, not a license to print money.

The cost of conversion may go through the roof as the deadline approaches. "As panic sets in, as giants like Andersen [Consulting] and IBM and CSC close their doors to new business, price inflation may kick in," Chandra said. But systems integrators can't afford to get greedy. "Large vendors can't price-gouge," he added, "because of their long-term relationships. Thus, vendors who control their cost structure will shine."

In a sort of backdoor business opportunity, some systems integrators have opted out of the crowded Year 2000 field, preferring instead to take care of day-to-day business while the client's IS department hurls itself at the conversion. XLConnect Solutions, Inc., a $115 million integrator based in Exton, Pa., chose this path.

"We think it's insiders who understand legacy systems," said Ian Dix, XLConnect's vice president of marketing. "We want to be the people who mind the store while everybody else is pulled off doing Year 2000." XLConnect counts Continental Airlines, Inc., GE Aircraft and Anheuser-Busch, Inc. as clients. The company focuses on

Mike Alcazar

For systems integrators, the Year 2000 is an expected customer service, not a license to print money

Tod Rice

"core IS stuff," such as network surveillance, application development and telecommunications, Dix said. He said he believes this niche will grow as "more and more IS resources are gobbled up by Year 2000."

MODEL CONVERSION

Some IS shops that got an early jump on the conversion and built a relationship with an integrator can point to model results. Cinergi, a regional utility based in Cincinnati, is using CSC to help it through the date change. The engagement began in October 1996. "We'd just gone through a merger," said Cinergi program director Dick Lewis. Of a total 350 applications, 120 needed to be converted. "We started with 28 million lines of code."

Cinergi and CSC spent 15 weeks in the assessment phase. Their triaging brought the code-fix tally down to 7 million lines.

Lewis said the advantage of working with CSC, rather than with a more specialized Year 2000 outsourcing shop, was that CSC had proven methodologies in place and was used to managing very large projects.

Cinergi still faces the testing phase of its Year 2000 conversion — 60% of the work, Lewis estimated — but the company is pleased with its assessment and implementation.

DEFINE "CRITICAL"

XLConnect's everything-but-Year-2000 strategy raises a reasonable question: As the big kahuna deadline approaches, how is it affecting the large systems integrators that offer a full range of services? Are other projects, ones that would be considered imperative in another time, falling by the wayside?

Not yet. But just you wait.

"Fortune 500 companies are looking at an eight-figure problem," CSC's Russo said. "These are board-level funding approvals. It'll be the end of '98 by the time [code] replacement starts. In '98 and '99, as renovation and testing rolls through, the impact on existing programs will be *dramatic*. Other initiatives are just going to have to be put on hold."

Colleen Arnold, vice president of global Year 2000 services at IBM Global Services, agrees. She breaks applications into three tiers: mission-critical, need-to-stay-in-business and nice-to-have. "Lots of nice-to-haves will be pushed back," she said.

Chandra said that as more and more internal IS resources go to the date change, there will be "a growing backlog of other IT projects to be addressed."

But several IS managers say they haven't felt the impact yet. Jim Johnson, director of EDS's renovation centers in Austin, Texas, said some clients' projects are actually accelerated as legacy systems that might otherwise lumber on for years get the heave-ho.

SKILLS CRUNCH

Nearly everybody agrees that there's a Year 2000 skills crunch and that it will worsen as the deadline nears. Johnson said the market for Cobol programmers is "definitely getting tighter; it's at capacity right now." CSC's Russo said, "We're not going to run out of funding dollars but out of bodies."

> Year 2000 conversions will generate $80B in worldwide business, including tools and services
> – Punk, Ziegel & Co

Russo forecast a spike in demand for Cobol programmers in the last half of this year. The prediction is based on a confluence of factors: First, the full impact of the Year 2000 calamity will soon reach even the deafest ears, bringing cries for action from technophobic business executives who previously refused to face the music. Next, many large companies are about to complete their assessments (the least labor-intensive step) and tackle implementation. Finally, Russo said, publicly traded companies' outside auditors must comment on their clients' Year 2000 program this year. "CEOs are worried about liability," he said. "They must show a credible plan" or face investor and stock analyst wrath.

EDS's Johnson added that while "a lot of people take a course, it really takes several years in an operating environment" to be truly useful. He predicted that organizations, including systems integrators, that start chucking warm bodies at the date change now will be "marginally successful" at best.

Coopers & Lybrand's Atkins is relatively sanguine about programming work. "I keep hearing about a lack of resources," he said, but Coopers & Lybrand hasn't yet felt the crunch.

IBM Global Services has 1,800 Year 2000 workers worldwide, and Arnold said that will grow to 3,000 by the end of the year. The company also has exclusive contracts with subcontractors worldwide.

"Skills shortage" refers not just to Cobol jockeys. Atkins said Coopers & Lybrand is looking to fill more senior positions in project management. "It's hard to find people you'd trust with, say, a $10 million engagement," he said.

From the lowliest tester to the highest-level executive positions, systems integrators will face a skills shortage with the rest of the IT world. (CSC's Russo predicted "panic in the streets.") But that doesn't necessarily portend a run of Cobol programmers on the unemployment office in 2001. In a report, Punk, Ziegel analyst Chandra said that though date-change demand will of course peak in 1999, he anticipates a robust market for at least three years afterward as lower-priority systems are gradually updated.

Integrators are also reducing their personnel exposure by using subcontractors where possible. IBM Global Services' Arnold said that the company has sent newsletters to retired Cobol experts, urging them to return to work — not directly for IBM but for one of its subcontractors.

The conversion problem, which looks at first like a windfall for systems integrators, turns out to be much more complex. It's a ripe yet dicey field that features assertive customers, hungry competitors on all sides and a chance to build — or damage — long-term client relations. After all, as EDS's Johnson said, "Once we deploy, we're there for the long term."

Ulfelder is Computerworld's senior editor, In Depth. His Internet address is steve_ulfelder@cw.com.

COMPUTERWORLD'S TOP 15 INTEGRATORS BY INTEGRATION REVENUE

	COMPANY NAME	LOCATION	WEB SITE	KEY CONTACT
1.	Electronic Data Systems Corp.	Plano, Texas	www.eds.com	John R. Harris, VP, Marketing and Strategy
2.	Digital Equipment Corp.	Maynard, Mass.	www.digital.com	Sue Lawrence-Longo, Worldwide Communications Manager
3.	IBM	Armonk, N.Y.	www.ibm.com	Dennis M. Welsh, General Manager, IBM Global Services
4.	Andersen Consulting	Chicago	www.ac.com	Ed Schrek, Worldwide Managing Partner, Technology Competency
5.	Oracle Corp.	Redwood Shores, Calif.	www.oracle.com	Sharlene Metcliff, Public Relations Programs
6.	Unisys Corp.	Blue Bell, Pa.	www.unisys.com	Robert Tumanic, Mng. Princ., Systems Integration Center of Excellence
7.	Hewlett-Packard Co.	Mountain View, Calif.	www.hp.com	Jim Sherriff, General Manager, Professional Services Organization
8.	Computer Sciences Corp.	El Segundo, Calif.	www.csc.com	Richard Wunder, VP, Consulting and Systems Integration
9.	Price Waterhouse	New York	www.pw.com	Cathy Newman, Managing Partner, Global Systems Integration
10.	Ernst & Young LLP	New York	www.ey.com	Ken Katzif, National Director, Systems Integration and Development
11.	Deloitte Touche Tohmatsu Intl.	New York	www.dtte.com	Stephen Sprinkle, Managing Director of Service Line
12.	Cap Gemini America	New York	www.usa.capgemini.com	Tony Connor, Senior Vice President
13.	KPMG Peat Marwick	New York	www.kpmg.com	Allan R. Frank, Chief Technology Officer
14.	Shared Medical Systems Corp.	Malvern, Pa.	www.smed.com	Michael Costello, VP, Corporate Communications
15.	American Management Systems	Fairfax, Va.	www.amsinc.com	Patrick W. Gross, Founder & Executive Vice President
	RESELLERS/INTEGRATORS BY INTEGRATION REVENUE			
1.	Inacom Corp.	Omaha	www.inacom.com	Geri Michelic, VP, Corporate Communications and Programs
2.	AmeriData Technologies, Inc.[1]	Stamford, Conn.	www.gecits.ge.com	Bill Bancroft, Executive VP, Technical Solutions
3.	MicroAge, Inc.	Tempe, Ariz.	www.microage.com	John Lewis, President, MicroAge Integration Group
4.	Entex Information Services	Rye Brook, N.Y.	www.entex-is.com	Herb Foster, VP, Corporate Communications
5.	USConnect, Inc.[2]	Stamford, Conn.	www.usconnect.com	NA

All financial data is for FY96 except where otherwise noted
*Estimate includes hardware and software components of integration revenue
**Estimate provided by G2 Research, Inc.

SELECT PERFORMANCE CRITERIA BREAKOUTS OF THE TOP 15

	Project's technical features	Project's business benefits	Project's final cost vs. original bid	Project's completion time vs. schedule	Integrator's training
1.	Digital Equipment Corp.	Digital Equipment Corp.	Digital Equipment Corp.	Digital Equipment Corp.	Shared Medical Systems
2.	Unisys Corp.	IBM	IBM	IBM	Unisys Corp.
3.	Hewlett-Packard Co.	Hewlett-Packard Co.	Unisys Corp.	American Mgmt. Systems	Oracle Corp.
4.	Oracle Corp.	Unisys Corp.	Hewlett-Packard Co.	Shared Medical Systems	Computer Sciences Corp.
5.	IBM	Electronic Data Systems	Deloitte & Touche	IBM	Hewlett-Packard Co.
6.	Computer Sciences Corp.	Deloitte & Touche	Cap Gemini America	Deloitte & Touche	American Mgmt. Systems
7.	Electronic Data Systems	Shared Medical Systems	KPMG Peat Marwick	Cap Gemini America	IBM
8.	Cap Gemini America	Oracle Corp.	Shared Medical Systems	KPMG Peat Marwick	Deloitte & Touche
9.	Shared Medical Systems	Cap Gemini America	Computer Sciences Corp.	Ernst & Young	KPMG Peat Marwick
10.	Deloitte & Touche	KPMG Peat Marwick	Ernst & Young	Hewlett-Packard Co.	Ernst & Young

TOTAL REVENUE	WORLDWIDE INTEGRATION REVENUE	WORLDWIDE INTEGRATION EMPLOYEES	PRIMARY VERTICAL MARKETS SERVED
$14.4B		NA	
$14.6B	$6.2B [6]	23,000	
$75.9B		29,600	
$5.3B	3.45B [10]	NA	
$5.7B [3]		13,000	
$6.4B	$1.9B [9]	NA	
$38.4B		5,000	
$5.6B	$1.3B [8]	14,000 [13]	
$5.2B		15,000	
$7.8B	$1.1B	7,200	
$5.2B		6,200	
$3.5B [4]	$875M	17,000	
$8.1B		NA	
$767M	$767M	5,000	
$812M		6,040	
$3.1B		1,318	
NA	NA	NA	
$3.5B		920	
$2.1B	$700M [11]	4,500	
$247M [5]		NA	

Integrator's support and service	Integrator's knowledge of your business	Integrator's systems integration experience	Integrator's project management skills
Unisys Corp.	Shared Medical Systems	Digital Equipment Corp.	Deloitte & Touche
Digital Equipment Corp.	Computer Sciences Corp.	IBM	Unisys Corp.
Hewlett-Packard Co.	Deloitte & Touche	Electronic Data Systems	Digital Equipment Corp.
Computer Sciences Corp.	Digital Equipment Corp.	KPMG Peat Marwick	Ernst & Young
Oracle Corp.	Unisys Corp.	Hewlett-Packard Co.	Cap Gemini America
IBM	KPMG Peat Marwick	Unisys Corp.	IBM
Shared Medical Systems	IBM	Deloitte & Touche	Computer Sciences Corp.
Cap Gemini America	Cap Gemini America	Oracle Corp.	Oracle Corp.
KPMG Peat Marwick	American Mgmt. Systems	Shared Medical Systems	KPMG Peat Marwick
Ernst & Young	Electronic Data Systems	Computer Sciences Corp.	American Mgmt. Systems

VERTICAL MARKETS KEY:

- Airlines
- Automotive
- Banking/Insurance/Financial Services
- Business Service & Legal
- Chemical & Pharmaceutical
- Communications, Telecommunications & Media
- Cross-industry
- Educational
- Government & Public Sector
- Healthcare
- Management
- Manufacturing
- Retail
- Transportation
- Utilities & Energy

REFERENCES BY RANK

INTEGRATOR

1. Xerox Corp., Inland Revenue (UK), General Motors Corp.
2. Dow Chemical Co., Swiss Telecommunications
3. AK Steel, Lucent Technology, Prudential Insurance Company of America, El Camino Hospital, Washington Mutual
4. Honeywell, New York Stock Exchange, North Arundel Hospital, Pfizer
5. Carnival Cruise Lines, Federal Reserve Banks, Toys R Us, Barnett Banks, Lufthansa Airlines
6. US Cellular Corp., Syncor International Corp., Snap-On Tools, Delta Air Lines
7. General Dynamics Corp., U.S. Air Force, Polaroid Corp., United Healthcare Corp.
8. Polaroid, Allergen, Anheuser-Busch, Bristol-Meyers Squibb
9. Hewlett-Packard Co., Monsanto, Southwestern Bell
10. Hughes Electronic Corp., Weyerhaeuser
11. U.S. Chamber of Commerce, Bridge/Firestone, The PMA Group
12. NA
13. West Jersey Health Systems, J.P.S. Health Systems, University of Wisconsin Hospital & Clinics
14. Telcel of Mexico, Defense Information Systems Agency
15. NA

RESELLER/INTEGRATOR

1. Johnson & Johnson, Nissan Motor Co., Brigham & Women's Hospital (Boston)
2. NA
3. Premier, Rockwell Automotive, State of New York
4. Fidelity, US West, Intel Corp., Blue Cross/Blue Shield
5. NA

FOOTNOTES

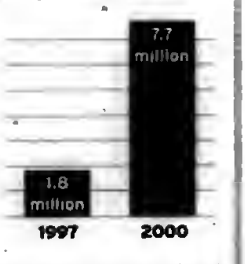
[1] Acquired by GE Capital IT Solutions in July '96. Customer satisfaction data is for AmeriData. Web site, headquarters and key contact info is for GE Capital.
[2] 19 of the independently owned systems integration firms that originally comprised USConnect recently merged with Ikon Office Solutions, Inc.
[3] FY97
[4] Worldwide company revenue
[5] FY95
[6] Worldwide Services Division
[7] IBM Global Services Division
[8] FY97
[9] Figure includes systems and network integration
[10] Estimate includes systems integration and professional service revenue
[11] Estimate by company
[12] FY95
[13] Estimate by company

COMPUTERWORLD
The Newsweekly for Information Technology Leaders

Briefs

[redacted]

Projected worldwide network computer shipments



Source: Zona Research, Inc., Redwood City, Calif.

Raychem moves off mainframes

▸ *Invests $5.5 million in Unix, SAP R/3*

By Jaikumar Vijayan

IT TAKES a lot of hard work — and hardware — to build a worldwide company database. Particularly if you have major manufacturing plants in nine countries, offices in 47 and markets in more than 100.

At least that's what Raychem Corp. has discovered.

Raychem is a Menlo Park, Calif.-based manufacturer of components for electronics, telecommunications and industrial applications. The company is two years into an effort to consolidate manufacturing, financial and sales information from around the world into a unified SAP R/3 client/server environment.

The objective is to standardize core enterprise resource planning practices worldwide.

For Raychem, that means moving away from IBM mainframe database platforms and RS/6000 application servers to an environment powered by symmetrical multiprocessing (SMP) Unix servers, RAID-based storage arrays and an Informix Corp. Online Dynamic Server database.

So far, the company has committed to equipment and software purchases that total $5.5 million. And it is ready to spend more if the need arises.

"We are a company of 8,200 people in 47 different countries. We need a lot of horsepower on the hardware side," said Thomas Jahn, Raychem's chief information officer.

The company already has completed the first two phases of its R/3 deployment, including financial, sales/distribution, materials management and production planning modules in its European and U.S. operations.

Raychem moves, page 54

RAYCHEM MOVES TO SAP R/3

Objectives
- To deploy R/3 worldwide in a client/server environment.
- To have one worldwide database for the entire company.

Server platform on which R/3 is being implemented:
- Sun Ultra Enterprise 3000, 4000 and 6000

Present status:
Deployed financial, sales/distribution, materials management and production planning modules

HANDHELD DEVICES

Fujitsu adds Windows NT capability to pen tablet

By Kim Girard

MOBILE WORKERS on the go now have a handheld device that runs Windows NT.

The new Stylistic 1200, a pen tablet made by Fujitsu Personal Systems, Inc. in Santa Clara, Calif., will help companies that want to standardize on Windows NT throughout their operation, observers said.

"NT provides a comfort level" and is more reliable than other operating systems used on handheld devices, said Rob Enderle, an area director at Giga Information Group, a Cambridge, Mass.-based consultancy. "If you break something, it doesn't bring down the entire operating system. You won't lose 10 entries. It provides a feeling of security," he said.

And an increasing number of companies that migrate to NT don't want to manage multiple operating systems, Enderle said.

Fujitsu — which dominates the often unstable pen tablet market — targets companies that need to store and share critical data for sales force automation, insurance, health care, utilities and marketing.

The Stylistic 1200 handheld, available this month, has a 120-MHz Pentium processor, a battery that lasts up to four hours, a 1.4G-byte hard drive, two PC card slots, 16M bytes of memory that expands to 48M bytes and a 128-bit video controller. It also comes with a keyboard.

Volume pricing for the Stylistic 1200 is $3,500; for a color display, it is $4,730. The Stylistic also runs Windows 95 or Windows for Workgroups 3.11.

In contrast to Fujitsu, other companies, such as Telxon Corp. in Akron, Ohio, and Norand Corp. in Cedar Rapids, Iowa, make handheld, pen-based devices with more ruggedized features. □

Price cuts continue

PCs are cheap, but weigh other factors

By April Jacobs

MAJOR PSICS cuts by some of the top PC makers may mean cheaper desktops for corporate users, but analysts said buyers need to keep an eye out for potential problems to protect their investments in the long run.

Although vendors such as Houston-based Compaq Computer Corp.; Dell Computer Corp. in Round Rock, Texas; and Hewlett-Packard Co. in Palo Alto, Calif., have cut prices by as much as 22%, users need to pay attention to more than price when buying machines.

Issues such as service, the financial health of a supplier, warranty coverage and technical support are the highest costs of owning and purchasing a desktop, analysts said.

"These announcements come just in time for the corporate buying binge that typically takes place in the third quarter of the year, but buyers shouldn't lose sight of the real costs, which are service and support," said John Dunkle, president of Workgroup Strategic Services, Inc. in Portsmouth, N.H.

Corporate users also said those factors figure in to decisions about which vendors they deal with. But price is important, too. That's because servers are a higher-ticket item, and service and support — and most of

Weigh, page 54

IBM chops ThinkPad prices to clear stock

By Kim Girard

IBM HAS SLASHED prices on ThinkPad notebook PCs up to 20% to clear the way for high-speed models this summer.

New offerings are expected to include laptops that use the 200- and 233-MHz versions of Intel Corp.'s Pentium MMX microprocessor, analysts said.

With the price cuts on older ThinkPads, IBM said it hopes to purge excess inventory at the high and low end to make room for new models this summer, said Nathan Nuttall, an analyst

IBM, page 54

LOWER PRICES FOR THINKPADS

High end — 760XD with CD-ROM
- Processor: 166-MHz Pentium MMX
- Hard drive: 3G bytes
- Screen: 12.1-in. LCD
- Memory: 32M bytes

Price cut from $6,499 to $4,999

Low end — 560
- Processor: 133-MHz Pentium
- Screen: Dual-scan
- Memory: 8M bytes

Price cut from $2,499 to $1,999

Servers & PCs

Large Systems • Workstations • Portable Computing

Briefs

Quantum axes prices

Quantum Corp. has slashed prices for its solid-state disk systems Models ESP 3000 and ESP 5000 up to 40%. Solid-state disks provide faster data access than traditional magnetic disk but have been used only in high-speed niche applications because of pricing. The Milpitas, Calif., firm provides the disks to storage subsystem manufacturers. Systems pricing starts at $7,500.

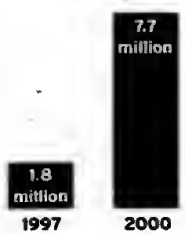
Quiet PCs

AST Computer in Irvine, Calif., last week released three super-quiet Bravo LC commercial desktops designed to give users access to the computers' inner components with a click of a button. The 5166 model, featuring a 166-MHz Pentium processor, costs $1,020. The 5166M costs $1,135 and has a 166-MHz Pentium MMX processor. The 5200 model has a 200-MHz Pentium chip and costs $1,155.

Mainframe interface

General Signal Networks, Inc. has announced interface cards that let Sun Microsystems, Inc. Peripheral Component Interconnect (PCI) workstations and servers have a direct Escon channel attachment to mainframes. The Link/9000 PCI cards let the Unix systems speak to the mainframe as a peer device at speeds up to 17M byte/sec. Stamford, Conn.-based General Signal is shipping the cards now with prices starting at $10,500.

Projected worldwide network computer shipments



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ANYTIME TWO COMPANIES LIKE

COMPAQ AND MICROSOFT

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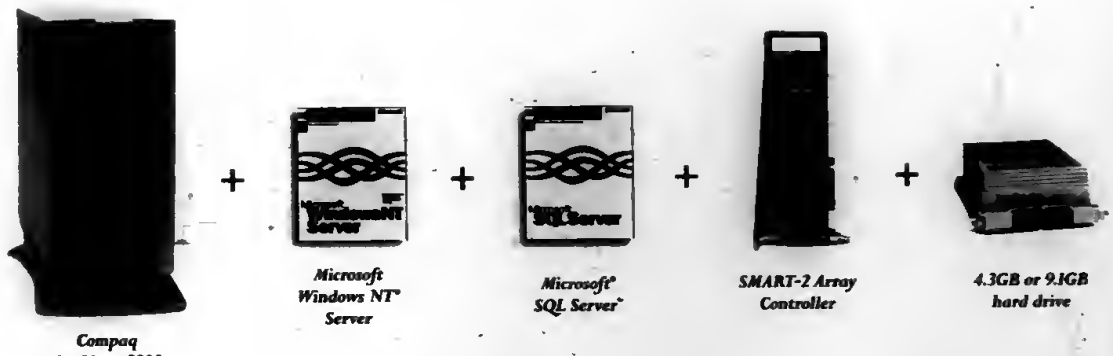

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NetPC seen as diversion tactic

By Rob Guth
Tokyo

THE NETPC promoted by Intel Corp. and Microsoft Corp. is shaping up to be little more than a gambit to divert attention from the network computer push, analysts at market researcher International Data Corp. (IDC) said last week.

NETWORK COMPUTERS

Though much fanfare accompanied the early demonstrations of NetPCs around the world last month, IDC analysts said vendors actually expect to sell very few.

"I don't think that anyone is going to derive a lot of volume from NetPCs," said Bruce Stephen, group vice president of personal systems research at IDC.

The NetPC concept — the brainchild of Intel, Microsoft and several major PC vendors — promises sealed, thin-profile PCs with which companies can equip their workforces at low cost. With their Zero Administration Windows software, the NetPCs are billed as easy to deploy and as offering a lower total cost of ownership than their full-blown PC brethren.

Despite the initial hoopla, vendors recently have acknowledged that they don't expect high sales of the machines. Last week, for example, managers at both Hewlett-Packard Co. and Compaq Computer Corp. — two of the original promoters of the concept — expressed their reservations about prospects for the devices.

And last month, Japanese PC vendors joined Microsoft in a flashy NetPC announcement in Tokyo, but none of the vendors displayed working products, none released specifications for their NetPCs and few had concrete plans as to when they would roll them out.

IDC forecasts that, worldwide, PC makers this year will ship no more than 200,000 NetPCs, a number that could shrink because of delays in some of the underlying NetPC technology.

PC FOCUS

The real achievement of the movement was to focus the market's attention on PCs following major promotions by many computer industry players of low-cost PC alternatives such as Oracle Corp.'s network computer and Sun Microsystems, Inc.'s JavaStation, the analysts said.

"The NetPC buys the Wintel empire time until they can get prices down and build in lower-cost-of-ownership features into regular PCs," said Sean Kaldor, a PC market expert at IDC. □

Guth writes for the IDG News Service in Tokyo.

Weigh other PC factors

CONTINUED FROM PAGE 51

all, reliability — count most.

Some users said it may be months before they see any real savings, because the equipment they order is purchased in bulk and must go through extensive lab testing before it is released to end users.

For example, Duane Stanley, director of communications and information systems at American Eagle Airlines, Inc., said PCs must go through four to 12 weeks of testing before users see them on their desktops.

BULK LEVERAGE

And prices can change. "We buy in volume, so there's a lot of [price] negotiation there anyway," Stanley said.

But, caveats aside, analysts agreed that the recent price cuts, coupled with vendors' efforts to make and distribute PCs more efficiently, amount to a fundamental change in the industry.

Compaq and Dell both are looking to cut expenses — Dell has adopted a team-building approach to manufacturing, and Compaq, traditionally an indirect seller, has pledged to adopt a production and distribution model that would let it deal more directly with customers in some cases. NEC Corp. recently announced plans similar to Compaq's.

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Raychem moves to R/3

CONTINUED FROM PAGE 51

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"We need a lot of horsepower on the hardware side"

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Mobile Computing

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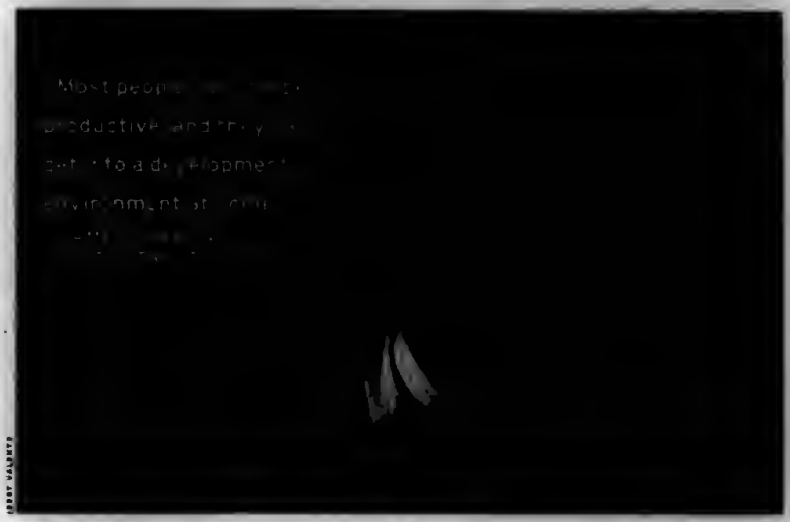
Briefs

IS warms up to telecommuting

▶ *More IS employees working from home*

By Rosemary Cafasso



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In turn, Profe gives his staff of 11 database developers the same treatment — if they need to telecommute to better manage their workloads, then so be it.

"They put in their hours, and it may not be from 9 to 5 in the office. It's the end result that is important," Profe said. Some people boost their productivity when they work from home, he said.

Profe's attitude is becoming increasingly common in information systems shops, according to interviews with IS managers and observers. Telecommuting, working from home via a computer connection, is no longer a radical approach to work, and it doesn't scare the pants off managers anymore.

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Inexpensive devices deter laptop theft

By Patrick Thibodeau

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There also are services that track stolen portables and insurance companies that will cover their lost value. And because the data on a notebook can be more important than the hardware itself, there are security experts with ready advice (see chart, page 57).

Cable locks such as the Master Lock Universal Notebook Security Cable from Kensington Microware (left) and Vanguard II by Secure-It (right) can help deter laptop theft

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Balodimus said users should also keep their laptops within sight for maximum protection.

If that isn't possible, cable locks, alarmed motion detectors and software that secretly uses a modem to report a theft are among the weapons designed to protect notebooks. Users also can hide laptops in specially made but ordinary-appearing travel bags — ones that don't act like a billboard announcing "Laptop in here."

Cable locks, which typically cost between $20 and $50, can be easily defeated if the thief is carrying a pair of heavy-duty cable cutters, users and vendors said. But the point of a lock

Devices, page 57

REVIEW▶ *Wireless PC card*

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REVIEW▶

AllPoints Wireless Network Card

OVERALL GRADE C+

3Com
Santa Clara, Calif.
(800) 527-8677
www.mhz.com
Price: $499

NetPC seen as diversion tactic

By Rob Guth
Tokyo

NETWORK COMPUTERS

THE NETPC promoted by Intel Corp. and Microsoft Corp. is shaping up to be little more than a gambit to divert attention from the network computer push, analysts at market researcher International Data Corp. (IDC) said last week.

Though much fanfare accompanied the early demonstrations of NetPCs around the world last month, IDC analysts said vendors actually expect to sell very few.

"I don't think that anyone is going to derive a lot of volume from NetPCs," said Bruce Stephen, group vice president of personal systems research at IDC.

The NetPC concept — the brainchild of Intel, Microsoft and several major PC vendors — promises sealed, thin-profile PCs with which companies can equip their workforces at low cost. With their Zero Administration Windows software, the NetPCs are billed as easy to deploy and as offering a lower total cost of ownership than their full-blown PC brethren.

Despite the initial hoopla, vendors recently have acknowledged that they don't expect high sales of the machines. Last week, for example, managers at both Hewlett-Packard Co. and Compaq Computer Corp. — two of the original promoters of the concept — expressed their reservations about prospects for the devices.

And last month, Japanese PC vendors joined Microsoft in a flashy NetPC announcement in Tokyo, but none of the vendors displayed working products, none released specifications for their NetPCs and few had concrete plans as to when they would roll them out.

IDC forecasts that worldwide, PC makers this year will ship no more than 200,000 NetPCs, a number that could shrink because of delays in some of the underlying NetPC technology.

PC FOCUS

The real achievement of the movement was to focus the market's attention on PCs following major promotions by many computer industry players of low-cost PC alternatives such as Oracle Corp.'s network computer and Sun Microsystems, Inc.'s JavaStation, the analysts said.

"The NetPC buys the Wintel empire time until they can get prices down and build in lower-cost-of-ownership features into regular PCs," said Sean Kaldor, a PC market expert at IDC. □

Guth writes for the IDG News Service in Tokyo

Signs that your PC vendor is a safe bet while it is waging a price war

- Early evaluation units go out on time
- Company isn't consistently late to market with products
- Company supplies replacement parts in timely fashion and in sufficient volume
- Company's service and support are satisfactory

Weigh other PC factors

CONTINUED FROM PAGE 51

all, reliability — count most.

Some users said it may be months before they see any real savings, because the equipment they order is purchased in bulk and must go through extensive lab testing before it is released to end users.

For example, Duane Stanley, director of communications and information systems at American Eagle Airlines, Inc., said PCs must go through four to 12 weeks of testing before users see them on their desktops.

BULK LEVERAGE

And prices can change. "We buy in volume, so there's a lot of [price] negotiation there anyway," Stanley said.

But, caveats aside, analysts agreed that the recent price cuts, coupled with vendors' efforts to make and distribute PCs more efficiently, amount to a fundamental change in the industry.

Compaq and Dell both are looking to cut expenses — Dell has adopted a team-building approach to manufacturing, and Compaq, traditionally an indirect seller, has pledged to adopt a production and distribution model that would let it deal more directly with customers in some cases. NEC Corp. recently announced plans similar to Compaq's.

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Mobile Computing

Briefs

Handheld terminal

Data General Corp. last week announced a docking station and communications software for its DataGenie III/Li handheld terminal with laser scanner, designed for users in warehouse, utilities and retail businesses.

According to officials at the Westboro, Mass.-based company, the Serial Docking Station, s four-slot device, includes an AC power supply and connects to standard communications ports. New docking communications software supports TCP/IP, file transfer protocol and ASCII modem communications.

HP plans new laptops

Hewlett-Packard Co. over the next 18 months will roll out three lines of smaller and lighter portable PCs for the commercial market, the company said.

The Big Foot notebooks, due in the fourth quarter of this year, will weigh 6.5 lb. and have a 13-in. screen. The other model in this line, due in the second quarter of next year, will weigh 7.1 lb. and have.s 14-in. screen.

According to officials at HP, the company also plans to roll out Thin and Wide models that weigh 4.5 lb., with screen sizes ranging from 12 to 14 in., in the second quarter next year.

And the first model in the Ultra Thin snd Light product line, weighing 3 lb. and having 12-in. screens, is also due in the second quarter of next year.

Upgraded PowerBooks

Apple Computer, Inc. has upgraded the processor in its PowerBook 1400 family of Macintosh notebooks.

According to officials at the Cupertino, Calif., company, the models now include s 166-MHz PowerPC 603E processor. In addition, the notebooks include larger internal drives, ranging from 1.3G bytes to 4G bytes. Prices for the models range from $2,500 to $3,500.

IS warms up to telecommuting

▸ More IS employees working from home

By Rosemary Cafasso

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– JAMES CURRAN, STATE STREET CORP.

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Devices, page 57

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OVERALL GRADE C+

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www.mhz.com
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Now that APC Smart-UPS® RM includes FREE web-enabled PowerChute® *plus*, rack mount server protection has never been easier

Power problems attack networks relentlessly. To protect hardware and data from system crashes, experts, network managers and computer users worldwide prefer one solution above all others combined: APC Smart-UPS. Now, all 120V Smart-UPS include FREE PowerChute *plus* power management software.

PowerChute plus provides unattended system shutdown and UPS management for Windows NT, Netware and other servers. Manage Smart-UPS via SNMP, DMI and Web browsers (shown above). Features vary by operating system.

The most reliable protection you can buy

Smart-UPS provide complete protection against power spikes, surges, brownouts, and blackouts. You'll also gain maximum server up-time and decrease management costs. Award-winning features include:

- CellGuard™ intelligent battery management monitors battery performance and extends battery life.
- SmartSlot™ internal accessory slot lets you customize and enhance the performance of your Smart-UPS.
- QuickSwap™ user-replaceable batteries can be quickly and safely swapped out without powering down the connected equipment.

Plan for and control crisis situations

PowerChute *plus* FlexEvents™ lets you control UPS reactions to power events. You can configure PowerChute *plus* to provide graceful, unatteoded server shutdown during an extended power outage or alert you to out-of-bounds environmental cooditions before they result in costly dowotime.

Web server & SNMP ready

APC's NEW WebAgent™ allows you to monitor and manage your Smart-UPS using your Web browser. New WebAlert™ notifies users of Web server shutdown via their browser. PowerChute *plus* also includes the PowerNet™ SNMP Agent plug-in, which allows you to integrate your Smart-UPS with your existing SNMP management strategy.

New NetShelter™ offers the perfect housing for Compaq® and other rack-mounted servers or internetworking equipment. Designed for easy selection, installation and expansion, NetShelter integrates APC's power control and environmental management solutions in one easy to order solution.

Smart-UPS and PowerChute *plus* provide the complete solution in one convenient box. Server protectioo and peace of mind have never been easier.

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Fax or mail this coupon to APC and learn how you can easily trade in your old UPS for discounts towards a new Smart-UPS.

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Telecommuting grows

CONTINUED FROM PAGE 55

shops seem most comfortable with this approach, as opposed to managing a full-time remote workforce.

James Curran, a senior vice president of the management information services division at State Street Corp. in Boston, said he and several of his IS staffers at the financial services company will telecommute on an "incidental" basis.

"It's handy when situations arise, such as when someone has a problem at home — their day care didn't show up or whatever," Curran said. "Most people can still be productive, and they can get into a development environment at home."

Many managers see telecommuting as a necessary benefit that boosts morale and productivity. Most significantly, IS managers find it a key tool to help them attract and keep good people in today's tight IS job market.

"You have to protect your assets," including your staff, said Larry Warehime, a director of systems development at Nautica Enterprises, Inc. in New York. "With today's IS [labor] shortage, people have a lot of leverage."

At Nautica, telecommuting is a standard option for all IS employees. As a result, workers "feel they are being treated as trusted, competent professionals," Warehime said.

A recent survey shows this IS trend fits with a broader telecommuting movement within the U.S. workforce. About 11 million workers now telecommute, a 30% jump from two years ago, according to Find/SVP, a market research firm in New York.

The company released the survey last month on behalf of Telecommute America, an advocacy group in Washington. Find/SVP polled 2,000 households on telecommuting as part of its 1997 American Internet User Survey. The group defines telecommuters as professionals who work from home at least one day per month.

Some industry analysts said that in progressive IS shops, telecommuting is becoming as mainstream as health benefits, vacation time and 401(k) retirement plans.

Today's workplace "is not a clock-punching environment," said Stephen Beitler, assistant corporate controller at Sears, Roebuck and Co. in Hoffman Estates, Ill., who oversees financial processes and systems. "If you hire mature people, they know how to take care of their jobs," Beitler said.

DIFFERENT REASONS

Gil Gordon, a telecommuting consultant in Monmouth Junction, N.J., said allowing employees to work from home "is purely a business issue today."

"Telecommuting has little to do with air pollution and traffic," Gordon said, in reference to the two issues that were most frequently discussed by early telecommuting proponents. "For an IS manager, this is a tool to run the organization."

At Nautica Enterprises, for example, the company provides basic hardware — such as low-cost PCs or modems — to new employees when they join the IS group. At most, it is a $1,500 investment per employee, Warehime said. In exchange, the IS group can log on to the system and fit in jobs at odd hours.

The firm recently completed a year 2000 conversion for its IBM AS/400-based accounts receivable systems, and telecommuting played a key role.

Two developers, working on code and database changes for six months, finished the conversion during a recent weekend from their homes in southern New Jersey and Brooklyn, N.Y. They exchanged electronic-mail messages and phone calls to stay in touch during the 16-hour computer run, working about four hours each, Warehime said.

Some organizations find savings when telecommuting is implemented on a wide-scale basis. For example, AT&T Corp. determined it can save between $1,200 and $6,000 annually per employee in associated real estate costs, said Susan Sears, a telecommuting project director.

The savings come from workers taking up less space in AT&T buildings, either by sharing cubicles or giving up an office entirely as they telecommute. For a company such as AT&T, which now has more than 36,000 managers telecommuting, that per-employee savings translates into millions of dollars, Sears said. □

Cafasso is a freelance writer in Walpole, Mass.

REVIEW▶ *3Com wireless PC card*

Frequent updates mar card

CONTINUED FROM PAGE 55

software), notebooks that run Windows and devices that use Microsoft Corp.'s Windows CE.

The lightweight card's body fits any Type-II slot, and its oversized header — which holds a battery and a detachable, movable antenna — extends from the computer. Powered by a 9V nickel/cadmium battery that recharges when the card is in a machine connected to AC power, the card provides 30 hours of active use. With an alkaline battery, it runs about 40 hours.

The card's 2W transceiver uses the radio frequencies of the major 900-MHz Mobitex networks, such as RAM Mobile Data USA LP or Cantel, Inc. That provides a mature, secure radio technology whose active coverage extends over more than 90% of the U.S. population.

The major drawbacks of such networks are speed and usage charges. The AllPoints card operates at a lazy 9,600 bit/sec., competitive with cellular connections but only a quarter of the speed of most telephone modems. For short, bursty information such as E-mail or sales inquiries, the speed is adequate. And keeping transmitted information short keeps the packet-based usage fees, which can range from $35 to $125 per month, down.

The card includes a copy of Netscape Communications Corp.'s Navigator 3.0 browser (the card also works with Microsoft Explorer) and software for use with wireless and E-mail services, including GoAmerica Communications Corp.'s Wireless Internet Service, DTS Wireless' Zap-It, LocusOne Communications, Inc.'s Wireless Service and RadioMail Corp.'s RadioMail. Third-party companies whose software supports the card include Motorola, Inc., Oracle Corp., Sybase, Inc. and XcelleNet, Inc.

We used both GoAmerica, which offers complete Internet access, and RadioMail for Internet E-mail service only. We ran it with a Hewlett-Packard Co. HP-320 Windows CE palmtop and an HP Omnibook 800 notebook computer. Service was satisfactory for a variety of E-mail and other traffic while standing or moving around an area.

Because of the traffic-intensive nature of the World Wide Web, we had to turn off the ability to receive images when browsing. That crippled our ability to get information from some sites and made navigating other sites downright painful.

The bundled software is developing rapidly and required frequent updates. Most of it wouldn't install or run correctly on our Omnibook 800, and even our Windows CE software was replaced twice. For now, keep your Web connection to 3Com's site on continuous standby. Expect the software to mature by the fourth quarter.

Compared with Cellular Digital Packet Data or cellular data connection, the AllPoints card has acceptable speed and price (both equipment and usage). Technology such as Metricom, Inc.'s Ricochet wireless service [CW, June 30] is faster and cheaper but very limited in coverage. When your workers need to connect while unplugged, the AllPoints card fits the bill. □

DeVoney is a freelance writer in Seattle. He can be reached at christ@cybercritic.com.

Devices deter theft

CONTINUED FROM PAGE 55

is to discourage someone from trying.

"If I were a thief, I think I would go to something that was easy rather than something that is going to take time," said Joan Issacs, an office manager at PQ Corp., a chemical manufacturer in Valley Forge, Pa. The firm secures laptops to desks with a cable lock. Users also can take the cable on the road and lock their laptops to a hotel room desk.

A plate attached to the computer with a powerful adhesive fixes the cable lock in place. Another option is a plastic security slot developed by Kensington Microware Ltd. in San Mateo, Calif. The slot, located on the side of many notebooks, fits a specially made cable lock. The slot is included on portables from Compaq Computer Corp., Dell Computer Corp., IBM and Toshiba Corp., among others.

Justin Myers, a facilities manager at a New York-based investment bank, purchased adhesive locks from Innovative Security Products in Prairie Village, Kan. "That glue bond to the plastic is actually stronger than sticking the small piece of metal into the plastic slot — we demolished a couple of laptops checking it out," Myers said.

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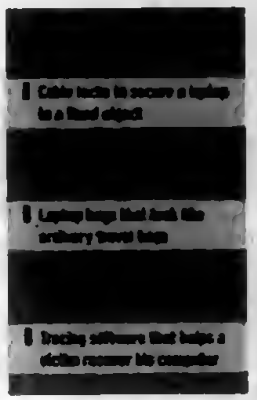
Cable locks to secure a laptop to a fixed object
Laptop bags that look like ordinary travel bags
Tracking software that helps a victim recover his computer

alarm system that attaches with a cable to the security slot or carrying case. The system will sound a 110-decibel alarm if tampered with.

But if your notebook is still stolen, there are ways to find it.

Absolute Software Corp. in Vancouver, British Columbia, and Computer Sentry Software in Franklin, Tenn., make software that will place silent calls (disabling the modem speaker) to monitoring centers and transmit the telephone number of the originating call. Both companies' products cost about $30, and each charges annual monitoring fees of $60.

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David Johnston, the agency's CEO, said the best protection for your laptop is to "keep the computer in front of you ... and don't leave it in an unattended vehicle." □

Telecommuting grows

CONTINUED FROM PAGE 55

shops seem most comfortable with this approach, as opposed to managing a full-time remote workforce.

James Curran, a senior vice president of the management information services division at State Street Corp. in Boston, said he and several of his IS staffers at the financial services company will telecommute on an "incidental" basis.

"It's handy when situations arise, such as when someone has a problem at home — their day care didn't show up or whatever," Curran said. "Most people can still be productive, and they can get into a development environment at home."

Many managers see telecommuting as a necessary benefit that boosts morale and productivity. Most significantly, IS managers find it a key tool to help them attract and keep good people in today's tight IS job market.

"You have to protect your assets," including your staff, said Larry Warehime, a director of systems development at Nautica Enterprises, Inc. in New York. "With today's IS [labor] shortage, people have a lot of leverage."

At Nautica, telecommuting is a standard option for all IS employees. As a result, workers "feel they are being treated as trusted, competent professionals," Warehime said.

A recent survey shows this IS trend fits with a broader telecommuting movement within the U.S. workforce. About 11 million workers now telecommute, a 30% jump from two years ago, according to Find/SVP, a market research firm in New York.

The company released the survey last month on behalf of Telecommute America, an advocacy group in Washington. Find/SVP polled 2,000 households on telecommuting as part of its 1997 American Internet User Survey. The group defines telecommuters as professionals who work from home at least one day per month.

Some industry analysts said that in progressive IS shops, telecommuting is becoming as mainstream as health benefits, vacation time and 401(k) retirement plans.

Today's workplace "is not a clock-punching environment," said Stephen Beitler, assistant corporate controller at Sears, Roebuck and Co. in Hoffman Estates, Ill., who oversees financial processes and systems. "If you hire mature people, they know how to take care of their jobs," Beitler said.

DIFFERENT REASONS

Gil Gordon, a telecommuting consultant in Monmouth Junction, N.J., said allowing employees to work from home "is purely a business issue today."

"Telecommuting has little to do with air pollution and traffic," Gordon said, in reference to the two issues that were most frequently discussed by early telecommuting proponents. "For an IS manager, this is a tool to run the organization."

At Nautica Enterprises, for example, the company provides basic hardware — such as low-cost PCs or modems — to new employees when they join the IS group. At most, it is a $1,500 investment per employee, Warehime said. In exchange, the IS group can log on to the system and fit in jobs at odd hours.

The firm recently completed a year 2000 conversion for its IBM AS/400-based accounts receivable systems, and telecommuting played a key role.

Two developers, working on code and database changes for six months, finished the conversion during a recent weekend from their homes in southern New Jersey and Brooklyn, N.Y. They exchanged electronic-mail messages and phone calls to stay in touch during the 16-hour computer run, working about four hours each, Warehime said.

Some organizations find savings when telecommuting is implemented on a wide-scale basis. For example, AT&T Corp. determined it can save between $1,200 and $6,000 annually per employee in associated real estate costs, said Susan Sears, a telecommuting project director.

The savings come from workers taking up less space in AT&T buildings, either by sharing cubicles or giving up an office entirely as they telecommute. For a company such as AT&T, which now has more than 36,000 managers telecommuting, that per-employee savings translates into millions of dollars, Sears said. □

Cafasso is a freelance writer in Walpole, Mass.

Devices deter theft

CONTINUED FROM PAGE 55

is to discourage someone from trying.

"If I were a thief, I think I would go to something that was easy rather than something that is going to take time," said Joan Issacs, an office manager at PQ Corp., a chemical manufacturer in Valley Forge, Pa. The firm secures laptops to desks with a cable lock. Users also can take the cable on the road and lock their laptops to a hotel room desk.

A plate attached to the computer with a powerful adhesive fixes the cable lock in place. Another option is a plastic security slot developed by Kensington Microware Ltd. in San Mateo, Calif. The slot, located on the side of many notebooks, fits a specially made cable lock. The slot is included on portables from Compaq Computer Corp., Dell Computer Corp., IBM and Toshiba Corp., among others.

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Things that can protect a laptop from theft:

- Cable locks to secure a laptop to a fixed object
- Motion-sensitive alarms that sound a warning when a laptop is moved
- Laptop bags that look like ordinary travel bags
- Travel insurance for laptops to reduce some of the sting of a theft
- Tracing software that helps a victim recover his computer

But if your notebook is still stolen, there are ways to find it.

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REVIEW▶ *3Com wireless PC card*

Frequent updates mar card

CONTINUED FROM PAGE 55

software), notebooks that run Windows and devices that use Microsoft Corp.'s Windows CE.

The lightweight card's body fits any Type-II slot, and its oversized header — which holds a battery and a detachable, movable antenna — extends from the computer. Powered by a 9V nickel/cadmium battery that recharges when the card is in a machine connected to AC power, the card provides 30 hours of active use. With an alkaline battery, it runs about 40 hours.

The card's 2W transceiver uses the radio frequencies of the major 900-MHz Mobitex networks, such as RAM Mobile-Data USA LP or Cantel, Inc. That provides a mature, secure radio technology whose active coverage extends over more than 90% of the U.S. population.

The major drawbacks of such networks are speed and usage charges. The AllPoints card operates at a lazy 9,600 bit/sec., competitive with cellular connections but only a quarter of the speed of most telephone modems. For short, bursty information such as E-mail or sales inquiries, the speed is adequate. And keeping transmitted information short keeps the packet-based usage fees, which can range from $35 to $125 per month, down.

The card includes a copy of Netscape Communications Corp.'s Navigator 3.0 browser (the card also works with Microsoft Explorer) and software for use with wireless and E-mail services, including GoAmerica Communications Corp.'s Wireless Internet Service, DTS Wireless' Zap-It, LocusOne Communications, Inc.'s Wireless Service and RadioMail Corp.'s RadioMail. Third-party companies whose software supports the card include Motorola, Inc., Oracle Corp., Sybase, Inc. and XcelleNet, Inc.

We used both GoAmerica, which offers complete Internet access, and RadioMail for Internet E-mail service only. We ran it with a Hewlett-Packard Co. HP 320 Windows CE palmtop and an HP Omnibook 800 notebook computer. Service was satisfactory for a variety of E-mail and other traffic while standing or moving around an area.

Because of the traffic-intensive nature of the World Wide Web, we had to turn off the ability to receive images when browsing. That crippled our ability to get information from some sites and made navigating other sites downright painful.

The bundled software is developing rapidly and required frequent updates. Most of it wouldn't install or run correctly on our Omnibook 800, and even our Windows CE software was replaced twice. For now, keep your Web connection to 3Com's site on continuous standby. Expect the software to mature by the fourth quarter.

Compared with Cellular Digital Packet Data or cellular data connection, the AllPoints card has acceptable speed and price (both equipment and usage). Technology such as Metricom, Inc.'s Ricochet wireless service [CW, June 30] is faster and cheaper but very limited in coverage. When your workers need to connect while unplugged, the AllPoints card fits the bill. □

DeVoney is a freelance writer in Seattle. He can be reached at chrisd@cybercritic.com.

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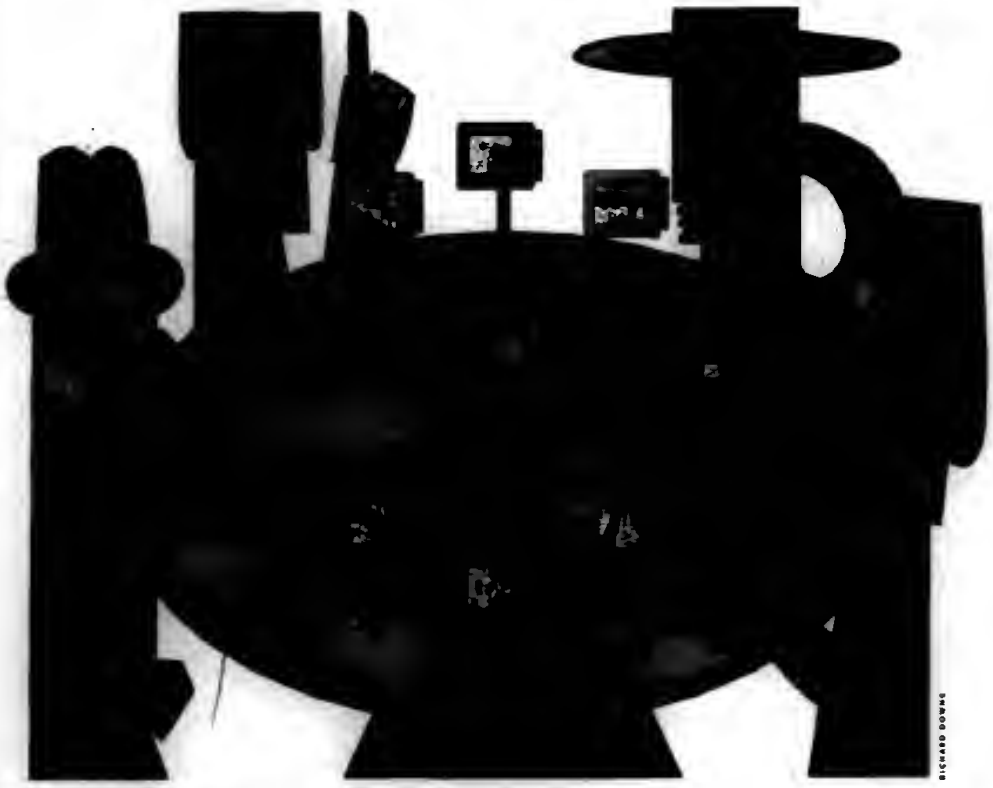
Managing

A lift for women
Formal mentoring programs help women move up the IS corporate ladder. Ms. MIS, page 64

ARCHITECTS!



RICHARD DOWNS

LET'S TALK!

What does the young generation of information technology architects think are the top IT issues? *Computerworld* senior editor Allan E. Alter invited a quartet of fortysomethings to an online roundtable and discovered that people, processes and the Internet are on their minds more than standards. Come, pull up a chair.

CW: What are the most important and toughest questions facing IT architects today?

STEVE FLINN, SHELL SERVICES: The tough architectural questions are tough because of uncertainty. Architects are now grappling with:

- The pace with which Internet technologies will overtake client/server technologies as the de facto application infrastructure standard.
- The dominance of certain key vendors: e.g., Microsoft, SAP. Dominant vendors drive IT standards, so understanding who will win is critically important for architects.
- How best to integrate the "structured" information world (stored in relational database management system) with the "unstructured" information world of documents, Web pages, etc.

CYNDIE WIGGINS, MERCK: The toughest question is defining and implementing the appropriate management processes. They include processes, roles and responsibilities, metrics and *organizational change*. To succeed, an architecture requires a fundamental change in a corporation's culture.

GARY KLIMOWICZ, MIKE: Cyndie's on target. Where there's a long history of good IT discipline, architecture isn't usually too hard to get going and adopted. But a lot of companies have not had good discipline in applications delivery and infrastructure support. They often do not understand the organizational, cultural and process changes that have to go along with longer-range planning that make an architecture successful.

A boss of mine once said that "you can't give someone an aspirin if they don't think they have a headache." Architects are often in the role of diagnosing that kind of malady.

CW: Why is managing organizational change so important in designing and building an IT architecture?

WIGGINS: At least [at Merck], architecture is a fundamental change to the organization. The evolution of our architecture has coincided with the overall shift in the business and evolution to a dynamic global enterprise. It requires a revamping of all of our IT management processes and systems and in a lot of cases a retooling of the IT professional.

Architecture is not just standards. It is also people and processes. Therein lies the tie-in of organization change to architecture.

MARY ANNE LUCZAK, FIRST CHICAGO: I agree with Cyndie. A successful architecture is dependent upon the people. Behavioral change is required, such as adhering to standards, sharing and reusing other organizations' code vs. building new code each time — using the architecture to help select outside packages.

WIGGINS: Organizations, for whatever reasons (i.e., history, sense of power or control) are not willing to make the change, especially when you suggest "centralization"! I believe that in a lot of cases the "architecture" fails to demonstrate "its" value because the organization implications are not recognized and/or implemented.

KLIMOWICZ: Architecture is about doing things in common for the greater good. If you have a corporate culture that fosters and rewards the renegade, you'll find it difficult to establish an architecture process. People at the top will have gotten there by having behaviors that are inherently antiarchitectural. And it won't just be

PEOPLE COUNT

"Architecture is about doing things in common for the greater good. If you have a corporate culture that fosters and rewards the renegade, you'll find it difficult to establish an architecture process."
– Gary Klimowicz, Nike

"Behavioral change is required, such as adhering to standards, sharing and reusing other organizations' code vs. building new code each time – using the architecture to help select outside packages."
– Mary Anne Luczak, First Chicago

"Architecture is not just standards. It is also people and processes. Therein lies the tie-in of organization change to architecture."
– Cyndie Wiggins, Merck

a single individual. They'll be all over the place.

CW: Has the purpose of architecture changed at all? Is the bang that companies want most out of their architecture bucks different now from what it was, say, in 1994 or 1995?

KLIMOWICZ: Prior to 1995, I think it was assumed that architecture was for defining standards, for establishing approved methodologies and so on.

Since then, businesspeople have grown tired of "architecture for architecture's sake." Architecture now is for whatever the business is for.

For example, in companies that compete on product excellence, IT architecture is increasingly for fostering improvements in the product process.

CW: What do you make of the Internet? And how far should companies go in building their IT architecture on the Internet?

FLINN: My view is, the Internet changes everything. It is much more significant for most businesses than the PC revolution was. And, therefore, it will have an even greater impact on IT architectures than the classic distributed processing paradigm had.

The real issue is how the Internet will impact business strategies. This is clearly an issue in change management. The Internet may mean the death of very successful business models — no change management is harder to deal with than that.

This will put the IT architect in the somewhat uncomfortable role of being the change agent with regard to the business strategy itself. This means being a teacher and coach. So add this key skill to the repertoire....

KLIMOWICZ: I agree with most of what Steve says, with the slight modification that the Internet has the *potential* to change everything in some businesses. But in others, it will often be just a different vehicle for doing a lot of the things that we did before.

But there are lots of industries where the Internet can be used to replace middle players in the value chain, and it will have tremendous impacts on the business model.

As architects, we have to be prepared to move the business in these directions. Business leaders are not going to take, "We have the wrong infrastructure to move business to the Internet" as an excuse for slow response. There is that education to make the businesspeople aware of why the infrastructure matters.

LUCZAK: I agree with both Steve and Gary. The Internet has the potential to cause a paradigm shift in the industry. The Internet has the potential to move us into the network-centric and multitiered architecture, which will allow ubiquitous access to information and services. As with any paradigm shift, in its early stages, there is resistance to change, chaos and lots of learning.

Some view the Internet environment as "client/server done right." For those who have developed in the client/server world, we quickly found that it oftentimes costs more to install/deploy the product than to develop it. The intranet/Internet significantly reduces the deployment cost. The Internet application development environment appears much easier to develop noncomplex information-oriented applications under. However, its development environment is just moving out of infancy and into its toddler stage. As it evolves, potentially so will its applications.

CW: What will the future be like?

FLINN: IT architects will focus on higher-level issues such as business processes.

The distinction between business processes and application software enabling those processes will blur.

Businesses will recognize the importance of better managing knowledge, and this will drive much of the IT agenda.

LUCZAK: Electronic commerce will continue to grow and drive the evolution of Internet technology and security sophistication.

Information repositories will expand to include both structured and unstructured information, e.g., images. They will be more accessible and usable through browsers, intelligent agents and search engines.

KLIMOWICZ: Companies struggle with business change much as they do with developing technology architectures. Both require a broad perspective: political, organizational, [return on investment], etc. I think the tools that will help architects most in the future will come from the arenas of organizational development, psychology and sociology, not just technology.

We'll discover that business differences ultimately make technology architecture differences, and we'll know how to assess those. Does your company grow by acquisition or expanding its core customer base? Compete by product, process or service excellence? By throwing ourselves at these problems over the next five years, we'll gain insights that will turn into best practices.

I don't think the best practices we'll see will look much like what we called enterprise architecture planning five years ago. It will be looser, more decentralized and more connected to business value.

To prepare ourselves? I'm not sure I know, except what seems to have helped me learn (which isn't nearly enough). Learn about the business. Define an architecture and live with your mistakes. Share your successes and failures with people at other companies. Read Peter Drucker and Charles Handy (author of *The Age of Unreason*), Machiavelli and von Klausewitz, Mets and Gartner and IDC, balance sheets and income statements. Read everything you can get your hands on regarding the technologies.

Then explain it to me! :-)□

Alter (allan_alter@cw.com) is Computerworld's senior editor, Managing.

Steve Flinn, 40
Title: Chief information officer
Company: Shell Services Co. in Houston
Electronic-mail address: sflinn@shellus.com
Duties: Create and execute business and technology strategies to enable the company (a business unit of Shell Oil Co.) to better serve its customers and transform itself into an independent provider of IT and services.

Gary Klimowicz, 42
Title: Senior manager, global IT architecture
Company: Nike, Inc. in Beaverton, Ore.
E-mail address: Gary.Klimowicz@nike.com
Duties: Create and adopt Nike's global core technology plan for the key information technologies used across Nike divisions and regions.

Mary Anne Luczak, 43
Title: First vice president/division head
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Duties: Manage the Enterprise Application Development Services organization, which supports application developers companywide; member of the Enterprise Architecture Team.

Cyndie Wiggins, 41
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Duties: Develop and steward a consistent IT planning process throughout Merck; develop and implement an overall architecture for information management.

COMPUTERWORLD

Pull up your own chair and offer your insights on the future of IT architecture in an open forum this week on our World Wide Web site (www.computerworld.com).

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MS. MIS
WOMEN IN INFORMATION SYSTEMS

A BOOST TOWARD THE TOP

Women in IS are finding power and value in formal mentoring programs to help them move up the corporate ladder

BY LAURA DIDIO

Mentors — older, experienced advisers to help and guide you — have been around since the ancient Greeks. They've informally been called hooks, rabbis and guardian angels.

Women in IS are discovering the power and value of mentoring and getting their businesses to recognize it by initiating formal programs.

While not commonplace, company-sponsored mentoring programs for women and minorities are multiplying, according to Aubrey Cramer, a mentoring consultant in Oakland, Calif. She says she's seen a 50% increase in the number of companies initiating diversity and mentoring programs in the past five years. "Women have gotten more vocal. Their upward migration would plateau, and they'd leave the company. When the talent walked out the door, high-level executives paid attention, and the mentoring programs are the result."

A variety of Fortune 1,000 firms, including Coopers & Lybrand in Chicago, Charles Schwab in San Francisco and Texas Instruments in Dallas, use them as highly visible initiatives to help reverse the underrepresentation of women and minorities. Companies also view mentoring as an insurance policy to help prevent their best women and minority management prospects from leaving for lack of advancement.

Consider the statistics. Last year, the National Research Council reported that women leave computer, science and engineering careers twice as frequently as men, and women's salaries in those professions trail those of men by 12% to 15%.

Ironically, some of the most traditionally male-dominated high-tech firms, such as TI and Cabletron Systems in Rochester, N.H., and financial houses such as Coopers & Lybrand, are at the forefront of the new mentoring programs.

COMPUTERWORLD
Laura DiDio this week will lead an online discussion of the issues presented in this column. Visit our Web site at www.computerworld.com.

Shauna Sowell, TI's vice president of corporate staff, was an engineer in 1989 when she started a mentoring group. The result: "The number of TI women in IS and overall management positions has more than doubled since 1991 and now stands at over 1,000," Sowell says. For her efforts at TI, Sowell last month was named to the Women In Technology International Hall of Fame.

But in 1989, Sowell and the 12 other women in engineering and IS who wanted to form a mentoring group worried that they were putting their jobs on the line. "We were afraid it would look like we were banding together," she says.

The women played by the rules, got management approval, created a mission statement and went to the vice president of TI's leadership team with the idea.

The mentoring program was approved and given a $30,000 annual budget. Now, TI's mentoring efforts include 20 separate initiatives. TI funds them all, and the employees meet on company time.

TI's three-pronged mentoring initiative includes New Hire Sponsors, who guide and coach new employees for a year; Technical Resource Mentoring to help people on specific issues such as changing jobs; and the formal Mentor Program, which helps women and minorities make it to the top echelons in MIS and other areas of corporate management. Pay for TI's managers is tied to reaching diversity goals in recruiting women and minorities into management posts.

Cabletron and Coopers & Lybrand's initiatives target the highest-performing women, minorities and — in Cabletron's case — white males, too.

Mentoring is very much a part of Cabletron's culture, thanks to Linda Pepin, director of human resources. "As a government contractor, we're required to formulate affirmative action plans. FastTrack [Cabletron's program] helps us achieve diversity and do succession planning." It also has the backing of president and founder Robert Levine. That may shock some because Cabletron has a reputation for being a bastion of male dominance, with Levine usually portrayed as leader of the pack. "I know I've had the reputation of being insensitive to these issues, but that's mainly because the press rarely writes about things like the FastTrack program," Levine says.

"We want qualified people to make it to management levels here, and we want to inspire loyalty among our employees. Anything extra we can do to promote that is a win-win situation for everyone," Levine says. So far, 100 workers have gone through FastTrack. Each is paired with a mentor who coaches them on various aspects of their jobs, with special attention to management and IS.

Allison Orzechowski, a team leader in Cabletron's Spectrum network management product group, is a "graduate." "It was an immense help," Orzechowski says. "It gave me focus and more confidence to do my job."

Similarly, Coopers & Lybrand has a program in which 100 top-rated women and people of color are paired with senior managers. The company chooses candidates who score highest in performance evaluations and works with them to hone their management skills. "We don't want to lose talent," says Iris Goldfein, Coopers & Lybrand's vice chairwoman of national human resources. The program also has the proactive backing of company Chairman Nick Moore. "He owned the issue," Goldfein says. "Moore stepped in and took over the diversity advisory group. It was a profound statement."

Coopers & Lybrand recognizes that it can't afford to have women leave the company before their male counterparts. "It's too big a loss of talent that's not easily replaced. And we can no longer afford not to look like the faces of our customers," Goldfein says. □

DiDio is Computerworld's senior editor, LANs and operating systems.

BILL GATES' NEXT EXCELLENT VENTURE

Dear Bill,

Alexander the Great, they say, cried when he had no more worlds to conquer. So how will a Master of the Universe, such as yourself, keep occupied in the next century?

You're in your 40s now, married and a father. So far, you've had nothing but success. Your competitors can only splutter in impotent outrage. And if you pull off your ambitions in the media industry, Internet and corporate computing worlds, you'll make the robber barons of the 19th century look like underachievers. You must be wondering, "What next?"

I'd like to offer some transition plans to mull over as you move from owning the PC software market to controlling the networked technology infrastructures of whole industries: Don't keep plodding along as you have been. Lift your ambitions higher. Higher, that is, in the realm of leadership. Like it or not, the world is thrusting this opportunity at you. You can either accept this mantle or avoid it.

The time is ripe. Whether you know it or not, the technology Microsoft is developing already plays a role in re-establishing links in a human condition that feels increasingly rushed, fragmented, isolated and desperate. The rise of so-called "electronic communities" is occurring as people are becoming more burdened.

Today, despite a growing economy and full employment, it takes two family members to achieve the economic gains it once took only one person to earn. Yet, there's no security.

Also, people face ever-increasing personal responsibility in critical life decisions about everything from careers and financial planning to health care, insurance, education and retirement planning. Technology can help individuals sort out such crucial choices. There has to be more to the convergence of TV and the Internet than just new forms of entertainment.

Meanwhile, the world's economy is shifting almost as fast as technology. A global market is emerging out of the crazy quilt of protected economies that are bordered by social and trade barriers and largely rooted in government/military-controlled models.

The heads of industries driving the innovations around the shift to a world economy won't become just important technical and business leaders, but important figures in reshaping public and social policy. That will happen either in a de facto manner or consciously. As you know, market economies are more efficient than government/military economies. The dark side of technology and re-engineered business process designs is that fewer people can do much more work. We need to be careful not to disenfranchise world populations from the benefits of business efficiency. We need to make sure that social, educational and economic gaps become smaller, not bigger.

In the absence of strong political leaders, people like you must play a role in reshaping public and trade policy and set the new principles and social norms of the electronic global marketplace. If business figures duck this responsibility, we shouldn't be surprised if the pain of free economies creates vacuums that will be filled by neo-Luddites and totalitarian regimes.

The task worthy of your talents is no longer to debate Larry Ellison on "fat clients" vs. network clients, or Scott McNealy on NT vs. Java. Your higher destiny — should you choose to accept it — is to help establish the guidelines for how advances in technology will help improve society, deliver better health care, improve education, help provide financial security for today's worried workers, increase the global standard of living and preserve the environment.

Other tycoons of history have made the leap: Andrew Carnegie quit amassing his fortune early and made lasting contributions as a philanthropist, and Alfred Nobel made amends for his arms business. But we have mixed examples in John D. Rockefeller and Henry Ford. Do you realize you're now in their category? Your $200 million gift of technology to the nation's libraries is a start, but how will your grandchildren perceive Microsoft's contribution to humanity?

That's your greatest challenge: to move into a role as a global ambassador of what technology can enable. And as you grow into this job, I urge you to be compassionate, not capitalistic; to be caring, not triumphant; to be a social visionary, not merely a software publisher; to be a role model for people other than business leaders; and to constantly elevate the debate as to "how technologies can improve our global society." That's a role that will adequately challenge your demonstrated boldness and vision. I hope you decide to take it on. □

Champy is chairman of consulting at Perot Systems Corp. in Cambridge, Mass. His Internet address is JimChampy@ps.net. His newspaper columns are syndicated by Tribune Media Services.

RESOURCES: IS MANAGER'S BOOKSHELF

The Digital Organization (AlliedSignal's Success With Business Technology)

By James D. Best
John Wiley & Sons, New York; $29.95, 224 pages (hardcover)

Best, who merged the communications and networking systems of Bendix Corp., Garrett Corp. and Allied Chemical into one (the company later became AlliedSignal, Inc.), knows change and how to implement it. In this book, he offers information systems managers detailed advice on creating a business strategy that will transform their companies into successful digital organizations. And he uses AlliedSignal, the technology and manufacturing company in Morris Township, N.J., as an example.

The bottom line: It's not easy. But reading this book can give you clear insights into how to manage the aspects that — together — can change an organization to meet the challenges of the Information Age. Best covers it all — from managing your strategy to managing execution, technology selection, people and application development.

Among his insights are the following:

- The help desk is a "critical function" whose status should be elevated so technicians will consider it a promotion to be moved there.
- If you want your company to move fast, "you need a culture that rewards recognizing bad decisions and taking quick corrective action. ... Avoid collisions by constantly reevaluating decisions and changing course when necessary."
- Be aware of resistance to change and, to help counter it, obtain leadership backing and public declarations of support.
- "... Explain why things need to change. People need to believe a rational business imperative drives an initiative, not empire building or ego gratification."

Best's last chapter, "Jungle Warfare," offers valuable advice for IS managers in dealing with outsourcers, consultants and contractors.

IS managers may find *The Digital Organization* valuable in helping their organizations become battle-ready in the Information Age. — Rick Saia

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JIM CHAMPY

Dear Bill, Xander the Great, they say, cried n he had no more worlds to uer. So how will a Master of Universe, such as yourself, p occupied in the next century?

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The time is ripe. Whether you know it or not, the technology Microsoft is developing already plays a role in re-establishing links in a human condition that feels increasingly rushed, fragmented, isolated and desperate. The rise of so-called "electronic communities" is occurring as people are becoming more burdened.

Today, despite a growing economy and full employment, it takes two family members to achieve the economic gains it once took only one person to earn. Yet, there's no security.

Also, people face ever-increasing personal responsibility in critical life decisions about everything from careers and financial planning to health care, insurance, education and retirement planning. Technology can help individuals sort out such crucial choices. There has to be more to the convergence of TV and the Internet than just new forms of entertainment.

Meanwhile, the world's economy is shifting almost as fast as technology. A global market is emerging out of the crazy quilt of protected economies that are bordered by social and trade barriers and largely rooted in government/military-controlled models.

The heads of industries driving the innovations around the shift to a world economy won't become just important technical and business leaders, but important figures in reshaping public and social policy. That will happen either in a de facto manner or consciously. As you know, market economies are more efficient than government/military economies. The dark side of technology and re-engineered business process designs is that fewer people can do much more work. We need to be careful not to disenfranchise world populations from the benefits of business efficiency. We need to make sure that social, educational and economic gaps become smaller, not bigger.

In the absence of strong political leaders, people like you must play a role in reshaping public and trade policy and set the new principles and social norms of the electronic global marketplace. If business figures duck this responsibility, we shouldn't be surprised if the pain of free economies creates vacuums that will be filled by neo-Luddites and totalitarian regimes.

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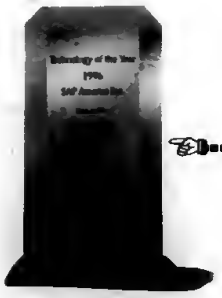

1996

R/3 3.1 named "Technology of the Year" by *Industry Week* magazine.

1996

With the release of R/3 3.1 Internet, SAP changes the world of business. Again.

1996

SAP addresses the unique needs of emerging corporations with the introduction of the Certified Business Solutions (CBS) program.

1997

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1997

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23. Dir./Mgr. Sys. Development, System Architecture
31. Programming Management, Software Developers
41. Engineering, Scientific, R&D, Tech. Management
80. Sys. Integrators/VARs/Consulting Management

CORPORATE MANAGEMENT
11. President, Owner/Partner, General Mgr
12. Vice President, Asst. Vice President
13. Treasurer, Controller, Financial Officer

DEPARTMENTAL MANAGEMENT
51. Sales & Mktg. Management
70. Medical, Legal, Accounting Mgt.

OTHER PROFESSIONAL MANAGEMENT
80. Information Centers/Libraries, Educators, Journalists, Students
90. Other Titled Personnel

3. Do you use, evaluate, specify, recommend, purchase: (Circle all that apply.)
Operating Systems
(a) Solaris (e) Mac OS
(b) Netware (f) Windows NT
(c) OS/2 (g) Windows
(d) Unix (h) NeXTstep
App. Development Products ☐ Yes ☐ No
Networking Products ☐ Yes ☐ No
Internet Products ☐ Yes ☐ No

4. Which of the following products do you buy, specify, recommend or approve the purchase of? (Check all that apply.)
(a) ☐ Internet software
(b) ☐ Internet browsers
(c) ☐ Web authoring/development tools

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22. Dir./Mgr. Network Sys., Data/Tele. Comm., LAN Mgr./PC Mgr., Tech. Planning, Administrative Services
23. Dir./Mgr. Sys. Development, System Architecture
31. Programming Management, Software Developers
41. Engineering, Scientific, R&D, Tech. Management
80. Sys. Integrators/VARs/Consulting Management

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Operating Systems
(a) Solaris (e) Mac OS
(b) Netware (f) Windows NT
(c) OS/2 (g) Windows
(d) Unix (h) NeXTstep
App. Development Products ☐ Yes ☐ No
Networking Products ☐ Yes ☐ No
Internet Products ☐ Yes ☐ No

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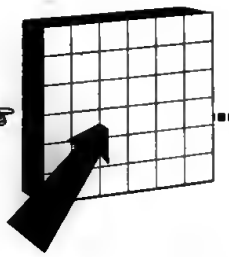

1993

SAP gains momentum while the customer installation base grows to over 1,900.

1994

SAP makes headlines by implementing R/3 for *The Seattle Times* in 88 days.

1995

SAP voted one of the Top 10 software vendors by *Software Magazine* 3 years in a row.

1996

SAP named the number one company of the *Manufacturing Systems* Software Top 50.

1996

AcceleratedSAP program introduced, making rapid implementation a reality.

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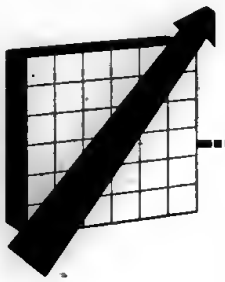
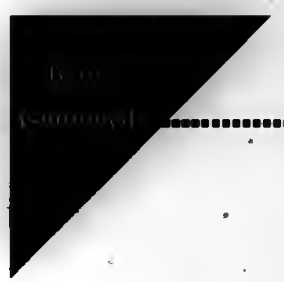
SAP opens the door for more companies worldwide to work their best with the release of R/3 industry solutions.



1997

Since the introduction of R/3, SAP's customer installation base has grown to over 10,000.



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Buyer's Guide

NT/UNIX an uphill battle

BY KEVIN BURDEN

Microsoft Corp.'s Windows NT isn't in the same league as Unix — not yet at least. Although Microsoft claims that businesses of any size can run their enterprise applications on Microsoft software and industry-standard hardware, a collection of industry analysts say, "Maybe in a couple of years, but certainly not now."

Maturity remains the issue, and Unix has a head start. Unix holds an unequivocal advantage over NT in scalability, availability and most other areas crucial to mission-critical applications, according to six industry analysts from different research firms. And although NT will continue to grow and mature during the next few years, so will Unix.

In fact, Unix is likely to remain more scalable than NT for at least the next five years, the analysts say. And there's a real chance NT may never catch Unix — but then, it really doesn't have to.

NT doesn't have to beat Unix any more than Unix has to beat MVS. Within two years, an NT server will comfortably handle 600 concurrent users. And though Unix exceeds that number today, the number of companies that will need better scalability than that in 1999 will be relatively small, according to Tom Bittman, a research director at Gartner Group, Inc. in Stamford, Conn.

Today, the market stands evenly split: Half the companies need Unix scalability, and half can get by on NT. But with the improvements that will be made

NT/Unix, page 72

ANALYSTS WE SPOKE WITH:

- **Aberdeen Group, Inc., Boston**
  Joe Clabby, research director
- **Forrester Research, Inc., Cambridge, Mass.**
  Jon Oltsik, senior analyst
- **Gartner Group, Inc., Stamford, Conn.**
  Tom Bittman, research director
- **Illuminata, Inc., Nashua, N.H.**
  Jonathan Eunice, analyst and IT adviser
- **International Data Corp. (IDC), Framingham, Mass.**
  Dan Kusnetzky, director of operating environments program
- **The Yankee Group, Boston**
  Brian Murphy, senior analyst
- **Patricia Seybold Group, Boston**
  Michael Goulde, senior consultant

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NT/UNIX

CONTINUED FROM PAGE 69

to NT, 90% of companies will probably be able to use NT in five years.

Not as powerful but capable of owning 90% of the market — that certainly sounds like the Microsoft way. But until NT catches up to Unix's scalability a bit more, the six analysts still recommend Unix for any application deemed critical to the business.

Computerworld spoke with the analysts about Unix and NT on a handful of topics, including scalability, availability and price. Also, we surveyed information systems sites representing more than 300 Unix and NT installations, and the results closely matched the analysts' comments.

Scalability

Summary: The consensus is that if your application needs to support more than 200 concurrent users, Unix should be the choice. The architecture of PCs, including I/O volume and raw system scalability, has too many performance hindrances. "We're concerned that companies are going to jump too far too fast on NT if they listen to [Microsoft Chairman Bill] Gates," Bittman says.

Bittman: Unix will have a scalability advantage over NT for at least another five years. Regardless of how big processors get, NT's scalability will stay hobbled by the PC's legacy I/O architecture, which becomes a bottleneck when 300 users do transaction processing. Unix is more scalable, partly because its hardware's I/O is less standards-driven, and it offloads much of its I/O processing to separate I/O controllers and processors. Twelve- and 16-way systems are also very common for Unix systems, while with NT, four-way is really the high end.

But through I/O improvements over the next couple of years, NT will scale to 600 concurrent users. "There won't be many companies that need to scale higher than that by 1999," Bittman says.

Clabby: Unix has the advantage because it's been around for more than 25 years and is much more mature. During the next five years, Unix's performance will go through the roof, leaving Microsoft constantly scrambling to catch it. Although NT will make considerable gains over the next two years, it won't catch Unix's scalability any time soon. And as NT moves up in scale, so will its pricing.

Gitlin: Databases larger than 50G bytes, applications that support more than 200 users and I/O-intensive applications such as transaction processing can't be supported by NT at this time. During the next three years, NT's improving scalability will let it further infringe on the low end of the Unix market. When that happens, only three Unix renditions will survive: Hewlett-Packard Co.'s HP-UX, IBM's AIX and Sun Microsystems, Inc.'s Solaris. Every other Unix vendor will have to embrace one of those flavors, become a niche vendor or die.

Kenneday: Unix supports more than twice as many concurrent users as a comparably sized NT server. But for a 100-client environment where only 25 to 30 clients would concurrently hit the server, you could comfortably use either Unix or NT. The choice would depend on which is easier to install, maintain and manage given the skills you have in place and which better supports the database, tools and applications you wish to use.

Reliability/Availability Clustering

Summary: Microsoft's Wolfpack clustering software (due by year's end) will give NT's reliability and stability a boost, but NT still won't equal Unix's availability for at least another five years — if then.

Eunice: Unix vendors, including IBM, Data General Corp. and NCR Corp., have been developing clustering since about 1991. They are intensely focused commercially and have a running start at clustering, whereas NT is just getting started with Wolfpack. It certainly won't outdo Unix's availability in two years, and probably not even in five years.

Bittman: The advantage Unix holds over NT in clustering will continue for at least five years, even after Microsoft releases its Wolfpack clustering software. High availability is the key to clustering, and Unix has a lot of flexibility in determining fail-over levels. But the availability Wolfpack delivers when it's released will be good enough for most users.

But NT's stability is a concern. Microsoft's business model demands that companies upgrade to keep its own revenue going. So Microsoft can be expected to add features to make NT 5.0 more attractive to enterprises not accustomed to frequent upgrades. The trouble is, when you add features, you add instability.

Murphy: More than five years after Unix, NT is taking its first useful steps toward clustering. But it won't be able to deliver Unix-type availability for years.

Administration

Summary: The advantage one has over the other mostly depends on the skills and expertise of your staff.

Bittman: NT is a very complex system with a veneer of graphics. It's very easy to undermanage it, and many of the security and administration problems companies face over the next few years will be from lack of skills, not NT's architecture. The demand for NT skills will be NT's biggest problem after scalability and availability problems are fixed (see related story, IT Careers, page 79).

Clabby: You'll need multiple NT servers if you require more than 8,000 transactions per minute, or you can use just one Unix box.

Software Infrastructure and Applications

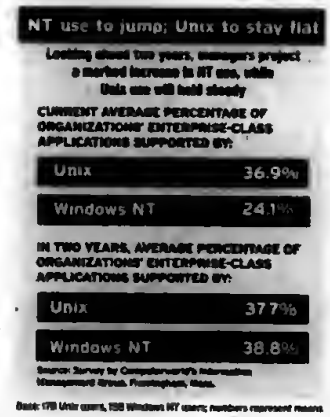
Summary: NT falls victim to its lack of maturity once again. NT won't be ready for heavy-duty transaction processing for at least four years. NT's scalability problems make Unix a better Internet server, and Unix has more commercial applications available.

Clabby: NT won't be a reasonable alternative for transaction processing until at least 2001. Unix will be the far better choice until that time. And there's no guarantee that NT will comfortably handle transaction processing by that time. A lot of things external to Microsoft could change when and if NT is ready for transaction processing.

Bittman: NT's software infrastructure will take some time to mature. Both Microsoft's and IBM's transaction processing servers won't be good enough for mainstream transaction processing until 2001. Unix will hold the advantage until then. Unix will also retain an edge over NT for available commercial applications until about 1999, when NT's suite will be large enough to make it a nonissue.

Unix and NT were designed as distributed systems, but Unix's maturity gives it the advantage. The world also tends to be heterogeneous, which Unix deals with better. Microsoft tends to work best with Microsoft.

The Internet's extreme scalability demands make Unix the favorite. About 70% of Internet servers will be Unix by 1999. For intranets, NT has the advantage because it's easier and cheaper to start up. About 60% of intranet servers will be NT-based by next year, rising to 75% by 2001.


NT use to jump; Unix to stay flat
Looking ahead two years, managers project a marked increase in NT use, while Unix use will hold steady
CURRENT AVERAGE PERCENTAGE OF ORGANIZATIONS' ENTERPRISE-CLASS APPLICATIONS SUPPORTED BY:
Unix
36.9%
Windows NT
24.1%
IN TWO YEARS, AVERAGE PERCENTAGE OF ORGANIZATIONS' ENTERPRISE-CLASS APPLICATIONS SUPPORTED BY:
Unix
37.7%
Windows NT
38.8%

Base: 178 Unix users, 158 Windows NT users; numbers represent means

Pricing

Summary: NT holds a slim edge.

Clabby: The leading NT box costs about $43 per minute to run about 7,500 transactions. The leading Unix machine handles about 30,000 transactions per minute at around $300. If you buy four NT machines, you get 30,000 transactions per minute at a price of $172, which is roughly half the price of the Unix box.

Bittman: Common sense says NT has the advantage. But if you look where the two operating systems really compete — high-end NT to midrange Unix — NT has only a 5% cost advantage. □

Burden is Computerworld's features writer. Associate editor Amy Malloy and senior editor Cathleen Gagne contributed to this article.

Head-to-head

IS managers rate Unix ahead of NT in most categories; NT leads Unix in cost of ownership and ease of management.

Average satisfaction score on a scale of 5 (very good) to 1 (very poor)

	UNIX	NT
Cost of ownership	3.49	3.82
Ease of management	3.11	3.78
Performance	4.27	3.64
Reliability	4.33	3.47
Scalability	4.30	3.47
Support for data warehousing	4.17	3.26
Support for transaction processing	4.13	3.28

Base: 178 Unix users, 158 Windows NT users; numbers represent means

COMMENTARY

Unix and NT challenges

MICHAEL A. GOULDE

It's easy sometimes to think that the battle for market supremacy between Unix and NT is the only challenge that faces the two technologies, but each has its own private challenge as well. And lurking on the horizon is yet another challenge that Unix and NT face in common.

The biggest challenge for Unix is to keep from looking old, tired and worn out. The emergence of the World Wide Web has given even the most mundane of applications a spiffy GUI. Yet Unix administrators and managers still must work all too often with an arcane command-line interface when installing and configuring Unix systems.

Although some die-hards would argue that they don't want a GUI, the lack of easy configuration and administration isn't helping Unix win any new supporters.

The heyday of the open systems movement of the late 1980s and early 1990s has passed. Spec 1170 is a memory. The heroes have deserted and gone on to fight the battles over Internet supremacy. When was the last time anyone mentioned microkernels in a conversation?

Maybe operating systems should be boring, but Unix risks creating total apathy toward itself, apart from any competitive efforts. The lack of a complete, modern GUI dates Unix and limits the breadth of its appeal.

The challenge for NT is quite different. Microsoft has provided graphical tools for managing virtually all NT operations. But NT is confronted with what we might call the enterprise glass ceiling. Instead of the prejudice, cultural barriers and sexism that face female executives trying to reach the upper echelons of management in corporate America, lineage, scalability and robustness are the glass ceiling for NT. Would you run your data center on Windows? How many servers to get 1 million transactions? Reboot to install software updates?

Microsoft really wants customers to accept NT as equivalent to high-end Unix servers. But try as Microsoft might, corporate IT just isn't buying the story. Even Scalability Day and 1 billion "transactions" didn't seem to sway anyone. Windows NT seems to be the Rodney Dangerfield of enterprise computing.

The irony of these challenges is that each platform has what the other wants. Unix has earned respectability as a platform for enterprise computing, and NT has kept pace with the latest in graphical environments. Unix has taken its place beside many mainframes, where NT would like to sit. Microsoft is integrating the Internet and the Web tightly into the NT interface.

Apart from their individual challenges, Unix and NT face a common threat from Java. If realized, the Java mantra of "write once, run everywhere" could translate to Java applications that run anywhere there is a Java Virtual Machine, even on your washing machine. The underlying operating system becomes invisible, unimportant and (shudder) irrelevant. Unix and NT will have to continue to add value in the areas of management and performance if they are to avoid becoming bit players in a Java-enabled world. □

Goulde is a senior consultant and vice president at Patricia Seybold Group in Boston (www.psgroup.com).

WHAT'S GOOD FOR YOU?

Analysts say these are current suitable environments for:

WINDOWS NT

- Low-end servers — 1,000 to 2,000 transaction/min. Has been stretching to the midrange level — 2,000 to 15,000 transaction/min.
- Workgroup/departmental LAN servers
- Comfortable support for 200 concurrent users
- Applications within an enterprise such as software distribution or a small database, but not mission-critical applications

UNIX

- Servers that perform more than 15,000 transaction/min.
- 800 to 1,000 concurrent users
- Internet servers
- Servers for mission-critical applications that need high availability and scalability
- Commercial and large-scale data processing
- Companies that want to discontinue their mainframe or minicomputer strategies

TOP [illegible] GRIPES

[illegible] NT shop respondents [illegible] survey said are in need [illegible]

1. [illegible] MANAGEMENT

"The management of the Unix arena is complex [illegible] specialized. If they continue [illegible] direction, Windows NT will be the [illegible] product and approach." — Systems manager at an East Coast manufacturer

"As we use Unix in more areas and have more users, we need to manage the system [illegible] We need to manage access and [illegible] We need to be able to tune [illegible] optimize the system for better [illegible] With a large volume of users, [illegible] The Unix system itself [illegible] manage." — Academic [illegible] at a university

[illegible] right now. If the [illegible] to run applications, Unix [illegible] be much better off. They would be able to compete with NT." — Vice president of information systems at a health care company

"In terms of expense, you need to have a port set up, and you need a person to run and maintain it. I have one Unix server, and we have one woman running it full-time and another person who helps her. I've got 12 Windows NT servers, and I run them all myself." — Network manager at a paper company

2. PORTABILITY ACROSS VARIED HARDWARE PLATFORMS

"We weren't very familiar with Unix. We know other operating systems, and we're having problems with the migration. It's all file-based, and we're having problems with that. . . . It should be more straightforward and easy to use and manage." — Database administrator at a metals company

"You have to recompile applications moving across platforms. It should be more compatible." — Engineer at a communications company

4. RELIABILITY OF APPLICATIONS AND SYSTEMS SOFTWARE

"We came from a mainframe environment; we had robust systems management, software and monitoring. In moving to Unix, I haven't seen the same robust software. It is getting better." — Software analyst at a printing equipment company

NT

1. SCALABILITY

"You're forced to create a rat's nest if you're joining more than four units together. More bad happens than good." — Vice president of IS at a rental car company

"You can't run applications that go from very small to very large. I wouldn't trust it." — Vice president of IS at a health care company

2. RELIABILITY

"NT is new and shows bugs. It is bug-prone, and we cannot rely on time to resolve the bugs if we are putting mission-critical applications on it." — Information technology manager at a manufacturer

"I love NT, but compared to Unix, its reliability is not up there yet. It's a little crummy, has its quirks and crashes too much. Also, its CPUs on five platforms aren't there yet." — IS manager at a pharmaceutical company

3. DIRECTORY SERVICES

"In my opinion, they don't even have directory services. They think they do, but they don't." — Computer engineer at a utility

"They promised a better directory in the 4.1 version, but it didn't happen. I think they are close to abusing a trust relationship with their customers." — LAN administrator at a communications company

4. PERFORMANCE

"We did a bunch of benchmarking for database warehousing. Using the same hardware, NT was 140% slower than Unix. There was 140% more throughput with Unix." — Director of MIS at a tourism agency

"Both performance and reliability, in comparison to Unix, are not quite there yet. They are making good strides, however." — Systems manager at a Midwestern manufacturer

Source: Computerworld Information Management Group. Response base: 178 users of Unix and 150 users of NT

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TOP USER GRIPES

The areas of Unix and NT that respondents to a Computerworld survey said are in need of improvement:

UNIX

1. EASE OF MANAGEMENT

"The management of the Unix arena is complex and specialized. If they continue in that direction, Windows NT will be the superior product and approach." — Systems manager at an East Coast manufacturer

"As we use Unix in more areas and have more users, we need to manage the system better. We need to manage access and privileges. We need to be able to tune and optimize the system for better support. With a large volume of users, it's hard to manage. The Unix system itself is hard to manage." — Academic computing director at a university

2. COST OF OWNERSHIP

"It's cheaper to run NT right now. If the software price was lowered to run applications, Unix would be much better off. They would be able to compete with NT." — Vice president of information systems at a health care company

"In terms of expense, you need to have a port set up, and you need a person to run and maintain it. I have one Unix server, and we have one woman running it full-time and another person who helps her. I've got 12 Windows NT servers, and I run them all myself." — Network manager at a pager company

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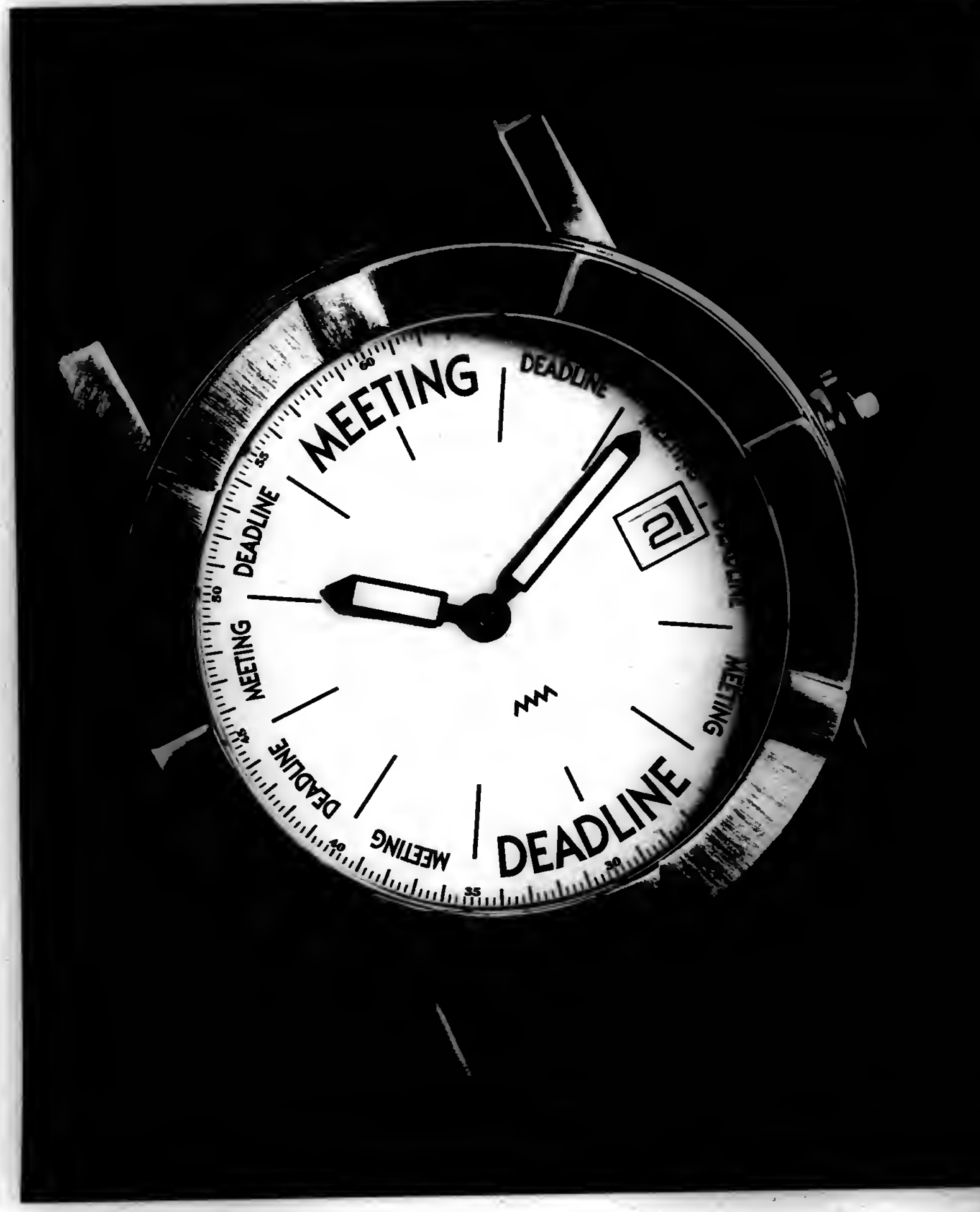
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In Depth

DARPA looks AHEAD

The U.S. research agency has built an unmatched technology record. But in an age of easy venture capital and tighter federal budgets, must its role change?

By Gary H. Anthes

IT IS THE MID-1960s and the computer industry is in its infancy. But the Cold War is raging, and the U.S. military is looking for ways to give its forces a competitive edge. With funding from the CIA and a computer on loan from the U.S. Air Force, researchers at Harvard University demonstrate a primitive virtual reality system.

Work from these early experiments leads to the formation in 1968 of Evans & Sutherland Corp. in Salt Lake City and to pioneering work in computer graphics at the University of Utah. Both are heavily funded by the U.S. Department of Defense's Defense Advanced Research Projects Agency (DARPA).

Today, the fruits of this DARPA-sponsored research in interactive computer graphics can be seen everywhere — in document creation systems, scientific visualization, computer-aided design, computer simulation, the entertainment industry and virtual reality.

THE CATALYST

Indeed, DARPA has been the catalyst for an astounding array of important computer technologies, including time-sharing, networking, the Internet, workstations, database technology, operating systems, semiconductors and parallel computing.

"If they had done nothing more than the pioneering work on the Internet, that would be sufficient to justify their existence," says Steve Kent, chief scientist of information security at BBN Corp. in Cambridge, Mass.

But although DARPA has so far escaped major attacks from congressional budget-cutters, observers worry that budget pressures may force the agency to focus more on projects with short-term military benefits, rather than long-term commercial payoffs. That would come as large corporate laboratories also forsake long-term research in favor of projects likely to add to the bottom line within a year or two.

DARPA's carefully targeted efforts in information technology have been far more successful than the Japanese and European megaprojects, says Paul Strassmann, former chief information officer at the Defense Department. "Small doses of venture money, particularly when invested in high-risk ventures, as inefficient as they may be, have been very good for America," he says.

Forty contractors who worked for DARPA and the National Science Foundation (NSF) recently completed a five-year project that created five "gigabit test beds" to study technologies for high-speed data networking.

The project was as notable for the change in attitudes it caused as for the technology it demonstrated, says Michael Roberts, networking vice presi-

dent at Educom, a consortium in Washington. "For the first time, it got [telecommunications] engineers seriously thinking about very high-speed connectionless networks. Now you've got billion-dollar investments that just *assume* there is going to be some kind of packet, connectionless architecture."

"What this did was make it possible for these [firms] to identify capabilities they had and make them available when they might have ignored them otherwise," says Robert Kahn, chairman of the Corporation for National Research Initiatives in Reston, Va., which led the effort.

LEVERAGING

The U.S. government will spend $74 billion this fiscal year on research and development, with the Defense Department accounting for about half that. DARPA's $2.1 billion budget is less than 3% of the total.

But DARPA often gets extraordinary leverage from its venture capital. The government spent only $20 million on the gigabit test beds, and corporations contributed between $200 million and $400 million more, according to Kahn, a co-developer of TCP/IP and an Internet pioneer.

And although many federal R&D investments result in narrowly focused, proprietary technology such as a missile guidance system, DARPA tries to ensure that its technology reaches a broad user base. Big commercial successes ultimately increase choices and lower prices for Pentagon buyers, DARPA reasons.

For example, the Arpanet and its TCP/IP protocol, developed by DARPA in the early 1970s, have evolved into today's ubiquitous and open Internet. "There's a bit of magic in that original investment," says William Scherlis, a computer scientist at Carnegie Mellon University in Pittsburgh. "The result was a protocol specification plus a lot of testbed building. Packaging the result as a protocol made it possible for any vendor to participate in the exploitation of the new ideas."

Similarly, a recently completed 10-year program in high-speed parallel computing for defense applications had a big but unexpected side benefit, says Howard Frank, who until earlier this month was DARPA's director of IT. The goal of developing parallel computers able to run at 1 trillion operations per second by the mid-1990s was met last year when the U.S. Department of Energy installed an Intel Corp. supercomputer that had been developed largely with DARPA money.

"The unexpected success was the invention of the entire midrange of parallel processing, like the machines from Silicon Graphics and Sun," Frank says. "That's a $2a billion market growing at 20% to 25% a year, and it all came from us."

WELL-POSITIONED

DARPA has never been better positioned to hit home runs like the Internet, Frank says, because there has never been so much demand for digital technologies or so much competition to develop them.

"Two decades ago, when we took packet switching technology to AT&T they said, 'Data? What the hell is data? Go away.' Companies are looking for an edge today, and they can find an edge with our stuff," Frank says.

DARPA's history isn't without controversy, however. In 1990, DARPA's director Craig Fields was sacked by the White House over initiatives it saw as more aimed at boosting U.S. economic competitiveness than at improving military capabilities.

In particular, the Bush administration faulted DARPA's high-definition systems program, its funding for Sematech and the flat-panel display industry and a brief experiment with equity funding of high-tech start-ups.

"It was foolhardy to attempt to create out of whole cloth a flat-panel display industry in the U.S., and it was clearly a trumped-up defense need," says Claude Barfield, director of science and technology policy studies at the American Enterprise Institute in Washington. "Now they've been pushed back in the defense direction, and I applaud that." But others worry that budget pressures could cause DARPA to avoid the long-term efforts such as the one that produced the Internet, particularly at a time when competitive pressures are causing companies to cut back on basic research.

Strassmann likens DARPA to a venture capital firm, with one difference. "They don't take equity, which means companies get much less interference with their management," he says.

On the other hand, DARPA's role as a venture capitalist may be less needed now, Strassmann suggests. "In the 1960s, when DARPA gave lots of money to Ivan Sutherland for graphics, that gave rise to Evans & Sutherland, one of the great founts of innovation," he says. "But if Ivan wants $50 million today, he just drives down to [Silicon Valley] and gets it in two schmoozes."

"That's great," says David Tennenhouse, director of DARPA's Information Technology Office. "Everything the venture capital firms do is something we don't have to do."

DARPA gives about $1.7 billion a year to researchers. Commercial venture capitalists invested $4.8 billion last year in IT, according to Venture Economics Investor Services in Newark, N.J.

Although the White House and Congress have said they will cut government R&D spending to help balance the budget, neither has threatened major cuts for DARPA. In fact, the president has requested a $100 million annual research program to boost Internet bandwidth by up to 1,000 times. The Next Generation Internet program, as it is called, is led by DARPA.

"Liberals like DARPA because they see the civilian spin-offs, and conservatives like it because it's going to keep us safe from the bad guys," Roberts says. □

Anthes is Computerworld's senior editor, special reports. His Internet address is gary_anthes@cw.com.

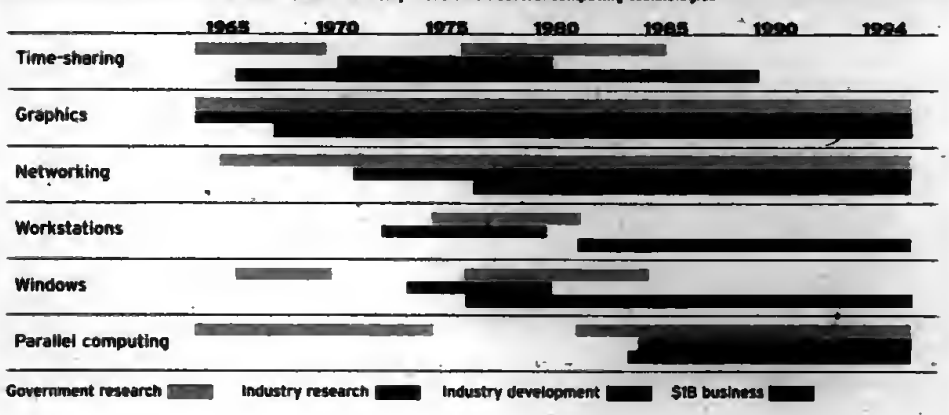
Heavy wall-paper

The following are DARPA-sponsored information technologies that have recently reached the market or are now in corporate and university labs. Papers can be obtained at www.darpa.mil.

- A disk drive gets a big boost in capacity using conventional media. The magic: read/write arms fitted with microscopic inertial navigation systems that position the arms so accurately, data can be packed 20 times more densely.
- Two million mirrors, each one-fifth the diameter of a human hair, are mounted on a memory chip and act as mobile digital switches. Each controls one pixel for large-area, high-resolution displays.
- A PCMCIA device with thousands of microscopic read/write heads puts 10G bytes of data in a wallet-size card.
- A handheld computer running advanced speech-recognition software performs real-time language translation in Bosnia. English spoken into the computer comes out a loudspeaker as Serbo-Croatian.
- An intrusion-detection system protects U.S. financial systems by using models of anomalous behavior to warn of impending threats. Local software agents learn how to detect fraud within a single corporation, and a "meta-learning" system combines the knowledge of the local agents.
- New tools improve hundredfold the ability to search and update collections of dynamically changing and inconsistent data-bases.
- "Active networks" allow data packets to circumvent a fault, thwart an attack or improve performance. Self-directing "smart packets" execute at each router they traverse, ensuring their own delivery.
- The Next Generation Internet program increases networking speeds by 100 to 1,000 times and offers end-to-end performance guarantees for globally distributed, mission-critical applications.
- A network "test bed" demonstrates 40G bit/sec. multiwavelength division multiplexing in optical fiber that will scale to multiple T bit/sec.
- An experimental holographic data storage system transfers data at 1G bit/sec. Data can be instantly retrieved using light.

TIME LINE

Government and industry research on several computing technologies



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IT Careers

Career enhancemeNT

By Melanie Menagh

Windows NT skills are fast becoming "must-have" for advancement, and fortunately, employers are looking within

From chief information officers to recruiters to consultants, the word on the street is that Windows NT is fast becoming the lingua franca for business. And information systems pros who want to move up had better tool up fast.

"The pattern in financial services is everybody's using it," says Brad Leland, a partner at Koteen Associates, an IS placement agency in Wellesley, Mass. "But I've seen it in other industries as well. It's the platform of choice in many areas; it's got the horses to pull the wagons."

The good news for IS professionals: A shortage of NT talent in the job market is forcing IS managers to train existing staffers for the skill whenever possible. When positions open up, they'll hire outside people with NT skills.

Stephanie Jason, a senior systems analyst who served as project manager during a recent conversion from Windows 3.1 to NT at the financial services firm where she works in New York, says, "We were very aggressive. The guys that were going to run the project went to training right away. Then as we needed to fill positions, we looked to people with [some] NT experience."

Bantam Doubleday Dell Publishing Group, Inc. in New York also faces some major training needs as it converts to NT. "We're hoping to bring in contractors at the rollout with NT skills," says Brian Jaffe, director of network and client services. "At the very least, we're going to have to do training with our existing staff. We're doing a slow migration from Windows 3.1 vs. blitzing the whole company in a six-month period."

GETTING STARTED

Companies that are hiring are eager to get qualified people and will consider candidates who have pursued a variety of training routes — as long as they bring the right mix of skills to the table.

"I'm looking at people who are willing to learn on their own, willing to put in the time to do a lot of reading," Jason says. "Classes can be so vague; you're lucky if half of what they teach applies to you."

For IS professionals looking to acquire the skill, the best teacher is experience. "I think hands-on experience hands down is the best way to learn," says Harold Goldberg, IS manager at Bally, Inc. in New Rochelle, N.Y. "Classes give you the theoretical background, but when you get off on your own — using books, a tape, browsing the Web, networking — the more information you can get your hands on, the better you'll do."

Jaffe says NT certification "is very nice, but it may not indicate a whole lot, nor will the number of months you've been working on it. I've interviewed people who said they have NT skills, but you really need to dig to find out what's the depth and breadth of that experience."

Jaffe says he hopes to find someone who knows something beyond the NT basics. "Do they know what's behind the NT registry? Do they know about security features? I want to see if they've spent time at the Microsoft World Wide Web site digging into the knowledge base and find out what they've discovered through trial and error," he says. "Class is fine, but that knowledge dissipates unless applied to something real and practical."

George Patalios, director of technology at the Ohio State University Medical Center in Cleveland, says, "I'm looking for people with familiarity with the new tools coming out. And you can only take advantage of the capabilities embedded in the product if you know how they operate behind the scenes."

Patalios says he likes his people to understand networking skills at a higher level: "Not the details, per se, but the high-level concepting."

LOOKING WITHIN

Many managers agree that although there are some IS professionals out there with a smattering of NT expertise, people with in-depth knowledge are rare — and expensive.

"We just recently hired help desk people with minimal NT experience," Jason says, "and we were already paying in the mid-40s. We were trying to get people with more NT experience, but had to weed out people asking in the 60s."

That's why so many companies are looking inward.

"Places will train in-house, so they have a proven performer with new skills," Leland says. "It's a good way to get promoted and increase your salary. A company that's invested in someone's training tries to make it attractive enough to keep them there." Leland says an effective strategy is "to sell your company on moving toward NT as a platform. Usually, your training will be part of the deal." □

Menagh is a freelance writer in Maple Corner, Vt.

WINDOWS NT-PLUS SKILL SETS

NT skills don't exist in a vacuum. Managers say there are a number of other skills that, added to NT, make an applicant irresistibly attractive.

▶ **OTHER NEW TECHNOLOGIES SUCH AS MICROSOFT EXCHANGE AND OFFICE 97**
"Nonexecutive people need familiarity with the new tools coming out." – George Patalios

▶ **PAIR WITH OTHER NOT TECHNOLOGIES**
"The strongest candidates would have a combination of NT and Unix, and behind that WAN and LAN." – Brad Leland

▶ **GOOD GENERAL TECHNICAL ABILITY**
"We're looking for strong technical and customer service, for people who aren't afraid to think and know how to apply what they've learned before to this new system." – Stephanie Jason

▶ **BUSINESS SAVVY**
"A good understanding of the different aspects of business – financial, marketing and retail. These are priceless skills that make integration to the user community much smoother."
– Harold Goldberg

▶ **HOW NT DOVETAILS WITH OTHER SYSTEMS**
"We need people who understand how NT works with Novell. We're expecting to be a dual environment for at least two years, and you can't just ignore the old stuff." – Brian Jaffe

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Software engineer with 2 years of experience as a s/w engineer or computer professional, who will develop s/w systems, applying computer science, engineering, and mathematical analysis, with 2 years of experience using Powerbuilder, Sybase and Unix. Analyzes s/w reqs and performs testing and user training after development. Extensive travel and frequent relocation. Master's degree in one of several limited fields: engineering, mathematics, computer applications, or physics. $68,000/yr. 40 hours/wk., 9:00 - 5:00. Send resumes, listing job order number 1012650 to Mr. Tom Rusnack, Mgr., Spears Industrial Park, 19 Pelusa Dr., P.O. Box 210, Charleroi, PA 15022.

Software engineer with 3 years of experience as a s/w engineer or computer professional, who will develop s/w systems, applying computer science, engineering, and mathematical analysis, with 3 years of experience using C++, OOA-OOD Tools, MFC and MS-Windows. Analyzes s/w reqs, and performs testing and user training after development. Extensive travel and frequent relocation. Bachelor's degree in one of several limited fields: engineering, mathematics, computer science, or physics. $68,000/yr. 40 hours/wk., 9:00 - 5:00. Send resumes, listing job order number 7025271 to Mr. Terry Kinney, Mgr., Office of Employment Security, 1270 N. Water St., P.O. Box 758, Kittanning, PA 16201

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Programmer Analyst/ Systems Analyst. Multiple consulting positions available. Analyze, design and implement business applications/software. Bach. in Comp. Sci (or equiv.) or related field required. Knowledge of PACBASE necessary. Must be willing to relocate. Send resume to: Monica Zortea, CGI Systems, Inc., 301 Lindenwood Dr. Suite 215, Malvern, PA 19355.

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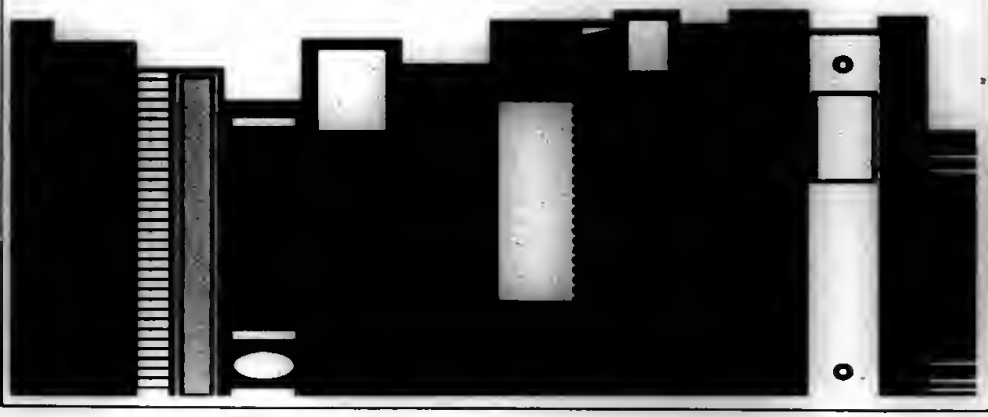

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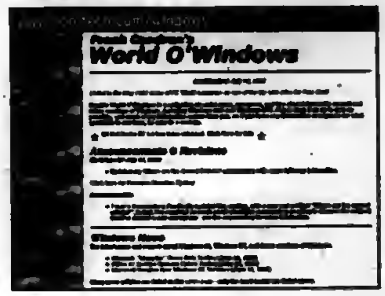
By Leslie Goff

FEATURED SITES

Frank Condron's World O' Windows



Condron is a systems analyst at a major automaker in Detroit.

He has 19 years of experience in information systems, including 10 in systems development, and he brings it all to bear at this site. It's a deep collection of resources, tips and news on Windows 95, NT and CE that Condron updates several times a week.

If you're looking for Windows drivers, this is the definitive site.

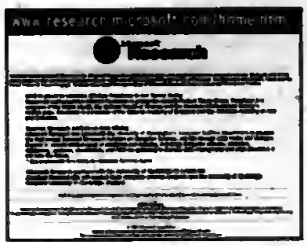
It has links to nearly 800 driver and upgrade downloads, from monitor definition files to modem installation files to video-card drivers.

Other resources, organized by operating system, include well-written how-tos for difficult problems, tips and shortcuts, technical support information and concise guides to Microsoft Corp.'s frequently unwieldy World Wide Web site, including links directly to the good stuff. Condron also serves up downloads for service packs and hot fixes, and he hosts several threaded discussion groups.

His news stories hit only the high notes.

But checking the Windows News Index is a good way to make sure you're up to date on all the announcements and rumors from Redmond, because Condron doesn't miss a beat.

Microsoft Research

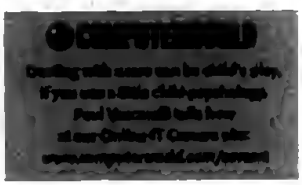


Do you want well-written scholarly research on new software technologies or are you merely speculating on what Microsoft is likely to come out with over the next few years?

Check out this site for the company's research and development arm, which supports basic and applied research in computer science.

Some of the material here ranges from arcane to just plain far-out for the in-the-trenches IS pro.

But many pages offer papers, demonstrations and downloads that will keep you on the cutting edge of trends in database technology, cryptography, application development tools, operating systems, convergence and other topics.

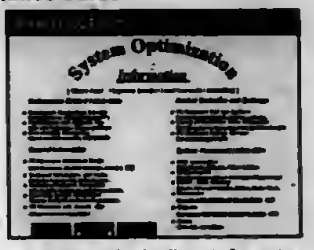


If you just want to browse, use the navigation buttons across the top of the screen. They'll access demonstrations, downloads and a comprehensive listing of available technical reports.

The downloads page offers MS Comic Chat, developer's kits for incorporating speech-recognition and dictation features in to applications and the beta 3 version of MS-Agent ActiveX controls, which add interactive personalities to applications.

If you want to target specific research areas, use the point-and-click menu on the left side of the screen.

System Optimization: The PC Hardware and Performance Guide



So you want to benchmark your PCs, reconfigure them and get more bang for your buck? This is the ultimate site for hardware jockeys. You can download benchmarking models and participate in comparison surveys for a variety of microprocessors from Intel Corp., Cyrix Corp., Advanced Micro Devices, Inc. and other vendors. You can learn how to overclock your PC safely, check out reviews of motherboards, modems and other peripherals, get current RAM pricing information, link to relevant vendor sites and access loads of other hardware technical tips and resources.

The site's author offers a good mix of material he writes himself and links to external sources when he sees fit not to reinvent the wheel. All the information is updated frequently. The advice is well-written and straightforward. The site has a large following from a wide range of fellow IS professionals, who actively participate in the myriad surveys available here.

QUICK HITTERS

Don's Java Central

This is an unintimidating site for direct links to an array of Java sites on the 'net. It isn't the most comprehensive source of Java information available, but it is one worth bookmarking because of its ease of use and practicality, especially for new Java developers.

Your best bet here is the Java Developer's Workshop. It offers a table of Java event differences by browser, links to various Java classes, tool kits and tutorials, a listing of known Java bugs, tips on creating layouts, notes on Java security problems and other resources. Don's Java Links page is a sound source of further information on the Web pertaining to available applets, tips on using the various development environments, JavaScript how-tos and general Java sites for application developers.

SupportHelp!

This is a strictly no-frills search engine — precisely the kind you want when you need technical support, and you need it now.

The right telephone numbers, links to Web sites and specific technical support pages, and electronic-mail addresses for most hardware, software and service vendors are never more than three clicks away. Search by product name, vendor or keyword.

In some random test runs, entering "Java" yielded 52 matches; "Visual Basic" brought back 36 hits; "SAP" garnered only SAP America, Inc. information.

Notably, "PeopleSoft" found no matches. □

Goff is a freelance writer in New York.

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SYSTEMS ANALYST. Analyzes user requirements, procedures, and problems to automate processing or to improve existing computer systems. Bachelor of Science degree in computer science, engineering, or math-related, and 3 yrs. exp. req'd. Must be able to travel Two (2) yrs. exp. in developing application systems, using AS/400, OS/400, CL/400, Query/400, SDA, SEU, Subfiles, DBU, DFU, dBASE IV+, Visual Basic, and Data Queues. $41,000/yr. Interested applicants apply by resume only to Georgia Department of Labor, Job Order # GA 6122376, 2943 N. Druid Hills Road, Atlanta, GA 30329-3809, or the nearest Department of Labor Field Service Office.

MCSE & MCT (Microsoft Certified Systems Engineer and Microsoft Certified Trainer and Internet developer Specialist) needed for Microsoft Solution Provider company. Salary negotiable. Send resume to Maureen Callery, Hornnick Systems, 2300 W. Glades Rd. Suite 150, Boca Raton, FL 33431.

Programmer Analyst II, Federated Sys Group, Norcross GA. Dsgn & dvlp sys level (UNIX & NT) interfaces for applic developers. Utilize SEER HPS to dsgn client serv applics in NCR Unix Sys 5 environ w/NetEssential Middleware on C++ platforms. Req BS in Comp Sci + 2yr exp or MS in Comp Sci. $39K-$62K depending on exp. Fax resume: S.Stevenson 770-246-8015, Job Code JL.

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SOFTWARE ENGINEER to design, develop, test, implement, maintain and support software for Network Printing Solution applications for CAD packages in a client/server environment using object oriented technologies, AutoDirect libraries, Microstation libraries & MDL in WATCOM C/C++ environment, WorkCenter standard printer drivers for DOS and Windows NT including HPGL and RTL. Develop integrated EDMS software in Visual C++ environment; Develop a PRF Generator using MDL4 Microstations and ADS for AutoCAD; Develop input interpreters that process various file formats such as AutoCAD DWG files and Raster files, and other file formats on DOS, Windows NT and UNIX environments; Source code management using SourceSafe. Require: B.S. degree in Computer Science with two years experience in the job offered or in the related occupation of Programmer. Required experience must include software development for plotting applications using AutoDirect Libraries, RTL, HPGL, Visual Basic and WATCOM C/C++. Salary: $50,000 per year, 8 am to 5 pm, M-F. Send resume to Georgia Department of Labor, Job Order # GA 8125866, 2943 N. Druid Hills Road, Atlanta, GA 30329-3809 or the nearest Department of Labor Field Service Office.

Sr. Software Engineer - Plan, develop, test and document computer programs, applying your knowledge of programming techniques and computer systems; evaluate user requests; consult with users to identify current operating procedures and clarify program objectives; and formulate operating procedure and program objective plan. Convert project specifications into language processable by computer; analyze, design, develop and implement systems in Client/Server environ. using GUI tools under multi-hardware and software platforms; code design, test and troubleshoot. Bachelor's degree in Elect. Eng., Math, Computer Science or related field + 3 yrs. in job offered. Software Engineering, Programming, Systems Analysis, Consulting or related field. Rel. occupational exp. must inc. at least 3 yrs. in the design, development and implementation of applications using IBM PC or compat., MS Win, Win NT, SQL Server, ODBC, MS Visual C++ (MSVC++) and DOS. Salary is $64,000/year, 8am - 5pm, 40 hrs/wk, M-F. Submit 2 copies of resume to: Case #70766, PO Box 8968, Boston, MA 02114. EOE.

Programmer/Analyst needed by W. Conshohocken, PA based info technologies Co. Must have 1yr exp in analyzing/dsgng/dvlpg & documenting web based applics using JAVA, JAVA-Script, HTML & Visual C++ in UNIX & SUN Solaris environmts incl GUI dvlpmnt. Masters-Comp Sci, Comp Engg or Elec Engg. Respond to: Visent Corp., 1 Tower Bridge, #800, West Conshohocken, PA 19420

Server Software Engineer: Design/develop Agent to comply w/ Bellcore GR303/TR303/ETSI-V5 interfaces for Access Network to provide broadband telephony services over hybrid fiber/coaxial (HFC) cable TV (CATV) network using DSET toolset on embedded system (eBOS). Use Bellcore/ETSI standards to generate GDMO's & ASN.1 Syntax for Managed Objects. Write code/scripts using DSET's API, C lang., DSET Compiler & MakeFile. Write test spec/perform off-line testing on Sun Work Station in UNIX environ. Perform on-line testing in real time environ. target system. Integrate hardware / software into system. Provide field support, debugging, provide customers w/ tech help, mentor other employees. Req: Bachelor's in Comp Sci/Eng + 2 yrs exp or 2 yrs as Research Engineer (Telecommunications Software). $82,000/yr, 40 hrs, 8am-5pm. Job is in Delray Beach, FL. Submit resume to: FDLES Bureau of Operations, 1320 Executive Center Drive, #110, Tallahassee, FL 32399-0667. Re: Job Order # - FL 1635263.

SOFTWARE ENGINEER to design, develop, test, implement, maintain and support Internet/Intranet based software applications using Rapid Application Development and Object Oriented design and programming techniques, as well as server side Web applications which interface to Oracle, DB2, MS SQL Server, Sybase SQL Anywhere, and MS Access DBMS engines on Unix (AIX, Linux, SunOS) and Windows NT based server platforms; Utilize Perl, Java, Javascript, C, C++, Visual Basic and Unix shell scripts for application development; Develop logical and physical data models of proposed software systems using ERWin/ERX CASE/data modeling tool; Design graphical user interfaces (GUIs) in Web based applications using Java, Javascript and HTML; using object oriented development techniques. Require: M.S. degree in Computer Science with two years of experience in the job offered. Salary $58,350/year, M-F 8 a.m. to 5 p.m. Forward resume to: Wesley Daniels, PM S.C., 1 PM B.C. Center (Int. I-77 & U.S. 21 N.), Blythewood SC 29016; Attn. Job FS.

Software Engineer: Dev. Internet callback, private line, direct fax & 800 svc billing sys generating daily, other periodic summaries, bills, call analyses reports. Analyze, design database/user interface to implmn/maintain customer info for US/overseas offices. Setup/maintain WindowsNT 2.51 Network. Train end users to run apps/provide tech assist. Dev apps for automated credit card processing, locating callers from any part of US, Biz. Map translation, ONE Number, Internet e-mail & long distance svs using C, C++, XMotif UNIX Shell Programming, Visual Basic 4.0, MS/Access 2.0/7.0, ASG, SQL Windows/NT, Windows 95, Windows 3.1, OS/2, DOS on IBM PS1 PS2, Aptiva, Compaq 7232 & Altos computers. Req: Master's in Comp Eng + 6 months exp or 6 months in position(s) in programming. Job is in Fort Lauderdale, FL. $46,000/yr 40 hrs, 8:30-5:30. Submit resume to: FDLES Bureau of Operations, 1320 Executive Center Drive, Suite 110, Tallahassee, FL 32399-0667 Re: Job Order # - FL 1635253.

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7:30am **Continental Breakfast & Conference Registration**

Concurrent Sessions:
- **Recruiting on the Internet: The Recruiter Drives the Superhighway**
  Ginny Pinzer, President, The Pinzer Group
- **Marketing IT Careers: What Works, What Doesn't and Why**
  Rich Moonblatt & Christina Barron, Bernard Hodes Advertising
- **Immigration Update**
  Harry J. Joe, Esq., Jenkens & Gilchrist

General Session:
- **Behavioral Interviewing Techniques**
  Dr. Paul C. Green, CEO, Behavioral Technology, Inc.

12:15pm **Luncheon Keynote:**
Paul Gillin, Editor, Computerworld

Concurrent Sessions:
- **Recruiting on the Internet: The Recruiter Drives the Superhighway**
  Ginny Pinzer, President, The Pinzer Group
- **Marketing IT Careers: What Works, What Doesn't and Why**
  Rich Moonblatt & Christina Barron, Bernard Hodes Advertising
- **Immigration Update**
  Harry J. Joe, Esq., Jenkens & Gilchrist

Town Hall Forum
Gary Cluff, President, Cluff & Associates

6:00pm **Program ends**

Selected sessions include:

Luncheon/Keynote Address
Paul Gillin, Editor, Computerworld

Paul Gillin, one of the industry's leading watchers of the Information Systems profession, will give you an up-to-the -minute view in this very special keynote address.

Recruiting on the Internet: The Recruiter Drives the Superhighway
Ginny Pinzer, President, The Pinzer Group

Before you get behind the wheel on the Internet, you'll need to know how to drive and where you're going. This session will serve as your driver's education class. You'll learn why to create an Internet recruiting strategy; what resources exist for recruiting on the Internet; and how other companies are using the Internet to reach candidates.

Marketing IT Careers: What Works, What Doesn't and Why
Rich Moonblatt & Christina Barron, Bernard Hodes Advertising

In this session, marketing experts will walk you through the various resources available to today's market and how you can apply them for maximum impact. You'll learn what pieces to assemble in your marketing mix starting tomorrow.

Behavioral Interviewing Techniques
Dr. Paul C. Green, CEO, Behavioral Technology, Inc.

Behavioral Interviewing is a structured interview process that helps you better evaluate candidate skills and improve the match between people and jobs. In this session, you'll learn about the critical steps in this process from one of the industry's leading interview experts.

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Gary Cluff, President, Cluff & Associates

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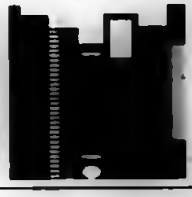

Programmer Analyst: 40 hrs/wk, M-F, $58,000/yr. System programming analysis and development of novell systems, applications for travel and tour services client. The system runs on IBM OS 400 and IBM OS/2 using APPC and Network access to the CRS, IBM COBOL 400, Data File Utility, DATA Definition Specification, Screen Design Aid, Screen Editor Utility, IBM Communication Manager 2, IBM LAN SERVER, IBM AS/400 Control Languages, Structured Query Language, and BASIC Programming Languages. The system also requires communication work with Mainframe System, (MVS/XA), using IBM COBOL II. Then subordinates on program implementation. Requirements: Bachelor of Science in Computer Science and four years in the job offered or four years as a System Analyst. Experience must include four years in SQL and OS/2. Send resumes to Linda Mikes, 1700 E. Golf Road, Suite 1122, Schaumburg, IL 60173. Must show proof of legal authorization to work permanently in the U.S. Employer paid advertisement.

Computer Systems Analyst: Develop & implement Benefit Payment Systems using COBOL II, CICS, PL/I, EAGLE 88; VSAM, MVS/ESA, & DB2 on IBM 3090. Create reports using EASYTRIEVE. Provide technical support to programmers and analysts. M-F, 40 hrs, 8:30-5, $54,000/yr. Requirements - Bachelor's degree in Computer Science, Electrical Engineering, or Mathematics, and two years experience in the job offered or two year's experience in the related occupation of Computer Programmer Analyst. Special requirements - One year's work experience with PL/I, CICS, VSAM, MVS/ESA, & DB2. Must have proof of legal authority to work permanently in the U.S. Send 2 copies of both cover letter and resumes to Illinois Department of Employment Security 401 South State Street, 7 North, Chicago, Illinois 60605 Attention: Joan Sykstus. Reference # V-IL 17539-S An employer paid ad. No calls.

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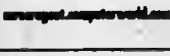

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Our name may confuse a few people, but our numbers won't. One of the Chicago area's top 100 businesses, Littelfuse, Inc. is a $270 million publicly traded company (LFUS on Nasdaq) with a towering reputation for success. We use the most advanced technology to provide our customers with the substantial advantages of the industry's most innovative products. Rapid expansion has created a variety of opportunities for experienced IS professionals to support our state-of-the-art IBM AS/400 platform with a Novell network. If your capabilities include electronic commerce and global manufacturing support, join an industry giant as:

SENIOR PROGRAMMER ANALYSTS
- 7-10 years of experience, manufacturing preferred
- RPG, AS/SET, SQL
- BPCS, Infinium preferred
- EDI hands-on experience ideal
- Barcoding a plus

PC NETWORK ENGINEERS
- 3-5 years of experience
- Novell CNA/CNE preferred
- Internet/Intranet development
- Token Ring and Fast Ethernet
- Windows 3.1, 95 & NT
- MS Office Suite; Lotus Notes

Success is the big story at Littelfuse, Inc. We offer a competitive salary and an outstanding benefit package, including casual business attire, 401 (k) with company match and company-paid pension. For immediate consideration, forward resume to: LITTELFUSE, INC., 800 E. Northwest Highway, Des Plaines, IL 60016. Fax: 847-391-0434. E-mail: ccharles@littelfuse.com *All resumes must indicate Dept. ISCW-CC on cover letter.* Principals only—only qualified candidates will be contacted. For more information about Littelfuse, check our web page at www.littelfuse.com eoe m/f/d/v

Software Development Engineer, Information Technology Department to design, code, and test software according to applicable SPs and work instructions; provide software and documentation to support SQA testing and for field trials and production releases; assist field to understanding and usage of software products, and provide documentation to explain software anomalies using X-Windows, MOTIF, C, C++ and TCP/IP networking languages. Unify database and UNIX operating system. Requires Bachelors level degree in Computer Science, Computer Information Systems, Math or Electrical Engineering. Qualified applicants must presently be eligible for permanent employment in the United States. Successful applicant must be able to perform job duties on date of application. Salary $38,675 to $45,500 per year, depending on qualifications, plus the Company employee benefit plan. 40 hours per week (8:30 a.m. to 5:00 p.m.); overtime as needed without additional compensation. Send resumes to Ms. Bobbe Diehl, Department No. 00748, Senior Human Resource Representative, boMenerous Vitek, 595 Anglum Drive, Hazelwood, Missouri 63042-2395. No telephone inquiries. An Equal Opportunity Employer

Database Analyst: Designs, creates, develops, codes, tests, modifies and implements relational database management information systems, using either Microsoft Access or Paradox, installed in a Local Area network environment. Insures integration and proper data flow and access in a network environment by use of database utilities to monitor database performance and utilization. Trains end users in use of complex database systems applications. Requires Master's Degree in Computer Science or Management Information Systems. Also requires 6 months experience in the job to be performed or 6 months experience as a Systems Analyst, Management Information. Experience must include performance of all duties specified in the job offered. Please send resume to: Gary L. Clayton, Executive Vice President, Illinois Association of Realtors, 3180 Adloff Lane, P.O. Box 19451, Springfield, IL 62794-9451

Faculty Positions

ROBERT MORRIS COLLEGE

Robert Morris College is a non-profit, private institution which awards numerous Associate Degrees and a Bachelor Degree in Business. A full-time Computer Science instructor is needed for the Springfield, Illinois campus. Part-time Computer Science instructors will also be needed for the Chicago and Orland Park campuses. A Master's Degree is required. The candidates selected for the positions will be expected to demonstrate a clear love for teaching and working with students. Send a letter of application stating whether you are interested in the day or evening division, a resume and transcripts to: Human Resources, Robert Morris College, 180 North LaSalle, Suite 900, Chicago, IL 60601 or fax to (312)236-8011.

Software Engineer: Implements, develops, modifies and designs an informational software system using Synon/2E CASE tools in an AS/400 midrange computer system. Uses various AS/400 utilities and programs in RPG/400 and COBOL/400 to insure that software systems are properly integrated and are performing in accordance with systems specifications at various client sites. Develops appropriate software testing, functional documentation and performance analyses for current software systems using CASE tools; modifies software enhancements to insure integration, interface and integrity with existing systems. Requires M.S. in Software Engineering, Computer Science or any engineering field and two years experience. Please send resume to: Daniel Duffy, Effective Data Interchange, Inc., 4811 Emerson Ave. Ste 208, Palatine, IL 60067 No calls.

Senior Systems Analyst (Evansville, IN) Design, analysis & development of application computer system written in COBOL/ 400 using RPG/400 & ILE/RPG under OS/400 for deployment on AS/400 hardware. Requires Bachelor's Degree in Computer Science, Engineering or MIS plus two years experience in job offered. $60,000/ year, 40 hours/week, 9-5, M-F. Send resumes with Social Security Numbers to: Indiana Department of Workforce Development, 10 N. Senate Ave. Indianapolis, IN 46204 Attention: Sean Blancaneaux, I.D.#3450631

Software Development Engineer - Develop measurement capabilities for the next generation of telecommunication measurement units in an embedded system using digital signal processing techniques. Responsibilities include software design and implementation of "ANSI C" along with assembly language, development of engineering and product specifications, analysis of customer requirements and algorithms development, improvement of software development process using TQM tools. Duties cover all phases of the development cycle through specifications, design, implementation, and testing. Requirements include a Bachelor of Science Degree in Electrical Engineering or Computer Science, with at least four years of experience in job offered or related field of telecommunications and analog and digital signal processing. Coursework or experience must include digital signal processing theory and application; transmission line theory; modeling and simulation; telecommunications theory and telecommunication system modeling and simulation. Matlab, C, and assembly languages for MC68HC11, TMS320C3X, Asymmetric Digital Subscriber Line (ADSL) techniques, and all phases of the development cycle through specification, design, implementation, and testing. Must have proof of legal authority to work permanently in the United States. Salary $54,000/year 40 hours/wk. Respond to ILLINOIS DEPARTMENT OF EMPLOYMENT SECURITY, 401 South State Street - 7 North, Chicago, Illinois 60605, ATTN: Sheila Lindsey, Reference # V-IL 16981 - L An Employer Paid Ad. No Calls. Send 2 copies of both resume and cover letter.

OPEN YOUR NETWORK TO EXCELLENCE.

PROGRAMMER ANALYSTS WANTED. Multiple Openings for all positions. All positions, unless otherwise stated, require 2 years experience in the job duties specified and a Bachelor's degree in Computer Science, Computer Engineering, Electronic Engineering, Electrical Engineering, Computer Information Systems, Mathematics or the foreign equivalent. All positions are 40 hrs/wk, 8am-5pm, M-F

REF. 17 Analyzing user requirements, database design, writing program function specifications and using IMS DB/DC, DB2 and COBOL. $50,000/yr. Will accept 3 years college education plus 3 years professional experience in the computer field in lieu of the required Bachelor's degree and 2 years experience, provided that, 2 of the 3 years experience is in the job duties specified.

REF. 18 User requirement analysis, database design, program specification and using DB2 and COBOL. $53,800/yr. Will accept 3 years college education plus 3 years professional experience in the computer field in lieu of the required Bachelor's degree and 2 years experience, provided that, 2 of the 3 years experience is in the job duties specified.

REF. 19 Business and system analysis and high level requirement studies and software programming on UNIX using C. $52,000/yr.

REF. 20 Development, implementation and maintenance of system and using PRO IV, PRO IV Superlayer and ORACLE. $45,200/yr.

REF. 21 Development and implementation of systems and using PRO IV, PRO IV Superlayer and ORACLE. $48,832/yr.

REF. 22 Defining business requirements and analyzing, designing and developing and using Powerbuilder and ORACLE. $44,000/yr. Instead of the required 2 years experience, we will accept 18 months experience in the job duties specified.

REF. 23 Requirement specification, functional analysis and design specifications and using DB2, CICS and COBOL II. $50,550/yr. Instead of the required 2 years experience, we will accept 1 year experience in the job duties specified.

MUST submit one original resume for each job applied and MUST include job reference number(s). Respond to: **Kim Pocock, (Insert Ref #), Syntel, Inc., 2800 Livernois, Suite 400, Troy, MI 48083. Fax: (248) 619-2894.** EOE.

SYNTEL

Senior Software Engineer to develop software for firm's cellular system using Shlaer Mellor Rumbaugh & ROOM Object Oriented paradigms: design, develop & implement real-time software feature in C++ on UNIX to enhance the system's functionality on a MIMD processor architecture; model, design, emulate, implement software using OBJECT-MAKER & OBJECTIME Case tools & ROOM modeling & specification; implement cellular traffic & device management software using real-time Finite State Machines interacting both synchronously & asynchronously; perform unit, component & system integration tests using simulation tools SCDEVOMTST & SETT & utilizing automated Shell/Perl scripts; isolate & correct real-time program defects employing CVD source level debuggers; execute & manage system onsite software build on SGI & TANDEM environments using HIMAKE tool; ensure software configuration integrity using the source code control system SABLIME; document real-time software high/low level design using FRAMEMAKER for a mobile telephony application; develop & enhance software test tool SCDEVOMTST to allow for simulation of cellular base station devices; support laboratory & field staff by troubleshooting operational problems in cellular service & introducing emergency program patches; investigate improvements in system utilization & cellular network management for a U.S.- standard-based cellular system. 40 hrs, 9:00am to 5:00pm, $53,100/year. Master's degree in Electrical Engineering required as well as two years and six months of experience on a Senior Software Engineer or two years and six months of experience on a Project or Senior or Executive Engineer or any combination thereof. Experience must have included: designing real-time telephony traffic & device management software in the cellular industry; refining & enhancing special cellular services software in a message-based & object - oriented high level language on a real-time operating system; modeling, designing & specifying the functionality of a real-time system using the SDL (ITU) language; implementing cellular infrastructure software using real-time Finite State Machines & synchronous/asynchronous prioritized message-passing; performing parallel programming with concurrent communicating processes on a MIMD multiprocessor hardware platform for a U.S.- standard-based cellular system; & managing software configuration for a large-scale cellular system. Course work must have included: operating, digital computer design, & telecommunications systems. Applicants must have proof of legal authority to work permanently in the U.S. - Send 2 copies of cover letter and resume to Illinois Department of Employment Security, 401 S. State-3 South, Chicago, IL 60605. Attn. Sheila Lindsey, Ref #V-IL-17206-L. No Calls. Employer paid ad.

Project Engineer for Automotive Firm. Duties include Software development for V6 Powertrain Control Module in Module GM. Includes the design and develop software specifications and software for the various aspects of the automobile including IAC control, torque management, cruise control, Class 2 communication, UART communication, and traction control system. Testing and debugging the software in the car using MDS System and Simucer. Includes working on Worst Case Analysis, Microcontroller System-Based Design, OBD II Software Development; Misfire Detection software development in various assembly languages; and conducting tests on automotive modules. Requires a Masters Degree in Computer Engineering. Requires one year experience in the job offered or one year experience on a Systems Engineer to include experience in the following: Worst Case Analysis; OBD II Software Development; Misfire Detection, Assembly Language and Microcontroller System-Based Design. Salary is $47,988 per year. Hours are 8:00 a.m. to 5:00 p.m. 40 hours per week. Send resume to 7310 Woodward, Room 415, Detroit MI 48202. Ref #180697 Employer-paid ad

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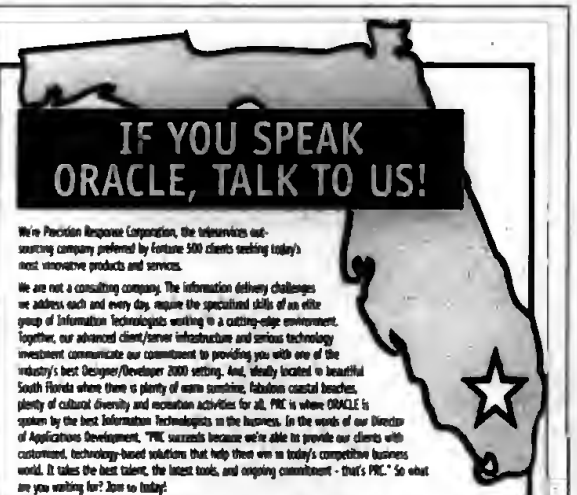

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We're Precision Response Corporation, the teleservices outsourcing company preferred by Fortune 500 clients seeking today's most innovative products and services.

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ORACLE Project Managers & Sr. Programmer/Analysts

Both of these positions require a Bachelor's degree and a minimum of 3-6 years IT experience along with demonstrated ability to communicate technical issues, analyze/create functional specs, and generate effective project plans.

Our Project Managers will be responsible for the management and direction of development projects which create application systems. To qualify, you must have at least 5-8 years in Information Systems with a minimum of 1-3 years project management experience in a software development client/server environment. An ORACLE technical background is preferred, but not required.

Our Programmer/Analysts will design, test, create and support computer programs required to solve business problems in accordance with software development standards, and will deal with a variety of business issues that are very complex. To qualify for these positions, you MUST have heavy ORACLE-based experience along with representative knowledge of at least some of the following:

ORACLE 7.x, Forms 4.5 & Reports 2.5 * object-oriented technologies * reusable data models * GUI design * client/server architectures * client/server generator tools * UNIX * Designer/Developer 2000 * systems analysis & design * structured design methodologies * PVCS * Sim Versioning tools * SQL/SQR * 3AD/RAD * CASE tools

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PowerCerv Technologies provides our clients a competitive advantage with our ADAPTication suite of Business Applications. We seek professionals dedicated to the delivery of quality solutions to our present and future business partners using the latest technologies available. Our continued growth has created the following career opportunities throughout the United States.

Application Specialists are Business & Technical Consultants responsible for application set up, training, development of functional specifications, data conversion mapping, and resolution of business issues with Distribution, Manufacturing, Financials & Sales Force Automation experience. Technical requirements include: PowerBuilder, Java, Visual Basic, C++, Sybase, MS SQL/Server, & Oracle.

Applied Engineers with 5-7 yrs of distributed application development experience and expertise in at least four of the following: Data Mart/Data Warehouse, OLTP, OLAP/ROLAP, DataModeling, PowerBuilder, Sybase/SQL Server. This senior level position will develop emerging product expertise for customer project deployment.

Systems Engineers with expertise in at least four of the following: PowerBuilder, Sybase/SQL Server, NT Server, LAN/WAN, database design, EAP or IS Strategic Planning. Position will provide Enterprise Architecture Planning for customers.

Internet Developers with 2-5 yrs of experience needed to develop WEB-Enabled customer-centric applications with interface capabilities. Experience with JAVA, Mahlsite or InterDev.

Positions require strong analytical & communication skills and ability to travel & work independently. ***Opportunities exist in: Atlanta, Chicago, Dallas, Los Angeles, New York, New Jersey, Philadelphia, Seattle, Tampa, & Orlando.***

PowerCerv offers competitive compensation and benefits. For employment consideration, please forward resume with desired location and salary history to: **ISBN, HRD, PowerCerv, 400 N. Ashley Drive, Suite 2700, Tampa, FL 33602; fax: (813) 222-0806; or e-mail: steven.nichols@powercerv.com** EOE/Drug-Free.

PowerCerv

Programmer/Analyst sought to work on the analysis, design, development and implementation of information management system applications and application enhancements for IBM mainframes using COBOL, IMS and DB2. Enhancements to applications run from minor to major analysis and programming tasks. Provide technical assistance to business users and production support. Requirements: Bachelors Degree in Computer Science, Information Science or related field or the equivalence of a Bachelors Degree. Two years exp. as a Systems Analyst. Two years experience using COBOL, IMS database, JCL (Job Control Language), IBM Mainframes and DB2. Salary: $49,500/yr. Hours: 40 hrs./wk. (M-F, 8:00 - 5:00). Send 2 resumes to Case # 70442, PO Box # 8968, Boston, MA 02114.

Software engineer with 2 (two) years of experience as a s/w engineer or computer professional, who will develop s/w systems, applying computer science, engineering, and mathematical analysis, with 2 years of experience using ORACLE RDBMS and at least one year experience with PL/SQL, SQL Forms, SQL Loader, Pro*C, UNIX and ORACLE Manufacturing and Distribution Applications. Analyzes s/w reqs. and performs testing and user training after development. Extensive travel and frequent relocation. Master's degree in engineering, physics, mathematics or computer applications. $115,000/yr. 40 hours/wk., 8:00 - 5:00. Send resumes, listing job order number 5012775, to Ms. Charlene Copley, Mgr 2103 Ninth Ave., Beaver Falls, PA 15010

Analyst/Programmers to plan, develop, test, and document computer programs. Evaluate user requests for new or modified programs to determine feasibility and cost and time required, compatibility with current systems and computer capabilities. Formulate, plan outlining steps required to develop program, convert project specs into sequence of detailed instructions and logical steps for coding into language processable by computers. Analyze, review and alter programs to increase operating efficiency or adapt to new requirements. Install and test programs at user site and consult with user personnel on site. Bachelor's or equivalent in Computer Sc or Engineering plus 2 yr exp in job offered or 2 yr exp as systems analyst or software engineer with the ability to perform the main job duties req. Salary: $42,536/yr. Job site: various unanticipated sites throughout the U.S. Employer location: Pittsburgh. Send this ad and your resume to Job # 7025993, c/o Greg Schwing, Office of Employment Security, 2100 Wharton St., Pittsburgh, PA 15203.

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OPERATIONS-RESEARCH ANALYST: Conducts analyses of management and operational problems and formulates mathematical model of problem for solution by computer. Travel out-of-state 30% req. Bachelors of Science degree in Mathematics. 2 yrs. exp. req. $22.5/Hr. 40hrs./wk. Job Site: Whitefish, Montana. Send this ad and your resume to Job Order #MT0349151, c/o Sandra Keller, Bozeman Job Service, 121 N. Wilson, Bozeman, MT 59715.

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PROGRAMMERS, Professional Services - Utilize your excellent communication skills supporting our 500+ worldwide clients. You must be fully versed in C under UNIX, NT, RDBMS (Oracle, Sybase, SQL), HTML and CGI skills preferred but not required.

We offer competitive salaries, excellent benefits and the opportunity to excel in an energetic yet casual environment. For consideration, please forward your resume, indicating position of interest by job title, to: **STC, P.O. Box 66190, Arcadia, CA 91066. FAX: (818) 359-3728. E-mail: todd@stc.com.** Please visit our web site: **www.stc.com.** EOE.

STC
SOFTWARE TECHNOLOGIES CORPORATION

QATAR GENERAL PETROLEUM CORPORATION

Qatar General Petroleum Corporation (QGPC) is the national oil company of Qatar with its head office based in the capital city of Doha. Geographically, Qatar is a peninsula projecting into the Arabian Gulf, with a warm coastal climate and is one of the most accommodating to expatriate employees, where spouses and families are encouraged to participate fully in the community. As a part of the continued expansion of Oil and Gas activities we are therefore seeking to fill the following key positions.

SENIOR NETWORK ENGINEER

A Senior Network Engineer is required for the management of the networking facilities. Responsible for QGPC corporate network, strategic planning of the wide area network architecture, troubleshooting and on-going maintenance activities. Proficiency in high-speed technologies and hands-on experience with ATM equipment are desirable. Applicants must have at least eight years of experience in this field.
Code: T71-ICS/000/00

SENIOR BUSINESS SYSTEMS PLANNER

An experienced Senior Business Systems Planner is required to perform and participate in Process Re-engineering, Systems Integration and Systems Architecture studies. Extensive experience in application planning and portfolio management is a must. Applicants must have at least eight years of systems development and project management experience and possess excellent communication and report writing skills.
Code: T72-ICS/189/96

SENIOR COMPUTING STANDARDS ANALYST

An experienced professional is required with a proven track record to develop, maintain and promote computing standards, procedures and business processes. The successful applicant will coach analysts in the application of Systems Development Methodology, data modeling, analysis techniques and perform QA functions. Applicants must have eight years of development and project management experience. Outstanding report writing and presentation skills are pre-requisite for this position. **Code: T73-ICS/274/96**

SENIOR INFORMATION ANALYST

Graduate in Information System, Business Administration or Computer Science with at least 7 years experience in business and information systems (preferably Oil and Gas) ideally in a corporate planning environment. Experience in development and implementation of EIS/MIS and data warehousing. Experience should ideally be at Team or Project Leader level including development and support (planning models, databases and applications development) ideally using Microsoft Office Suite (Excel, Access, VB); Oracle products desirable. **Code: T74-CPL/709/96**

SYSTEMS ANALYST (COMMERCIAL SYSTEMS)

Systems Analysts are required to assist QGPC in implementing applications in Logistics, Finance and Human Resources. Applicants should have a proven track record in delivering effective systems and solutions with at least six years experience in IS development. Specific experience in called for in the following areas: business processes and their related information requirements and analysis, client/server design and development, Oracle RDBMS and SQL tools. Project Management and Mainframe experience would definitely be an asset. **Code: T75-ICS/095/96**

SYSTEMS ANALYST (END-USER SUPPORT)

A Systems Analyst is required having in-depth knowledge of current packages such as Novell Netware, cc:Mail, Windows and the full components of Microsoft Office. Good knowledge of the new trends in microcomputing and LAN technologies is a must. Solid experience of at least six years micro-based information technology with emphasis on defining end-user requirements and PC products evaluation is highly desirable.
Code: T76-ICS/353/97

SYSTEMS ANALYST (END-USER DEVELOPMENT)

A Systems Analyst is required to perform PC software and hardware evaluation, define policies and document procedures for PC end-users, conduct presentations and seminars for promoting new technology in user-Departments. Excellent awareness of current directions on micro-computing and LAN technologies, plus in-depth knowledge of current packages such as MS Windows NT, Novell Netware, cc:Mail, Windows 95, Lotus Notes, and the full component of Microsoft Office is a pre-requisite. Applicants must have at least six years solid experience in this field.
Code: T77-ICS/276/97

Candidates for the above INFORMATION TECHNOLOGY (IT) positions must possess a degree in Computer Science or equivalent from a recognized University. Knowledge of the Oil and Gas industry would be a definite asset. These positions demand very good communication and inter-personal skills and the ability to work in a multi-national environment.

Employment Package

The rewards, like the challenges are substantial and include negotiable salaries free of local taxes, married status, indefinite term contract, free spacious air-conditioned accommodation, free medical and dental care, children's education assistance, generous annual leave (with paid airfare), transport allowance and heavily subsidised sporting facilities.

For immediate consideration, please RUSH CONFIDENTIAL DETAILED RESUME, copy of degree or certifications including appropriate details as to current salary, references, availability and contact phone, fax and e-mail number. Please include two passport size photos and a copy of the relevant pages of passport. Please submit information indicating the position(s) for which applying.

QATAR GENERAL PETROLEUM CORPORATION, c/o THE CHERBONNIER GROUP, INC., 3050 Post Oak Blvd., Suite 1600, Houston, TX 77056, USA; Fax (713) 960-1168.

For more vacancies and additional information on QGPC and QATAR, please visit our website at: http://www.qgpc.com.qa.

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- Chat Rooms

MIS Programmer Programmer Analyst in UNIX operating system environment writing various shell scripts analyzing and using IEF (Information Engineering Facility) tools to assist in design and analysis using GUI technology to create prototype screens, write database programs using Pro C (SQL Embedded in C) in Sybase environment. Determine corporate requirements to help design infrastructure for development of client/server-based systems and applications. Design develop implement test and support systems software including networking communications, operating systems and relational databases for corporate office regional office and store machines to support various subsystems. Requires BA/BS degree in Computer Science or equivalent. Minimum of 1 year of experience in C/C++ programming in UNIX environment; 6 months of experience in PASCAL and FORTRAN programming; 6 months of experience in VAX environment; 6 months of experience in system analysis/software engineering using case tool; 3 months of experience in Pro C programming on Oracle/Sybase; 3 months of experience in Computer Architecture assembly language UNIX-based operating system computer graphics and Microsoft Windows applications such as Lotus Paradox; 2 semesters college level coursework in Statistics. (Above experience may be obtained concurrently and in educational or work setting.) $30,000 per year. 8am to 5pm. Apply to nearest Job Service Office or submit resume (with Soc Sec #) to Job Service Midtown Plaza 320 Wilkesboro Avenue North Wilkesboro NC 28659 Reference Job Order #NC6861044 and DOT code 030.162-010. EOE

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Norwest Services, Inc. is the technology and services organization supporting our business partners to help keep Norwest at the forefront of the banking industry. We currently have 2 positions to be located in either Minneapolis, MN or Denver, CO and several other positions that may be located anywhere in the U.S. with 25% travel required.

These positions perform analysis of vendor contracts against business goals, use standard contract templates, draft contract language to address business specific issues, lead negotiations, and analyze data to identify cost reduction opportunities across businesses. Requirements include a BA or equivalent, 3+ years experience in contract negotiations and drafting, strong communications and leadership skills, the ability to handle a heavy workload, and a broad understanding of software/hardware technologies and products.

Norwest offers an outstanding benefits package and salary commensurate with your experience. Please send or fax a resume, including salary history, to: Norwest Services, Inc., Attn: Human Resources-BFO, 255 2nd Avenue South, Minneapolis, MN 55479-1049 Fax: (612) 667-0673.

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Sr Software Engineer responsible for design and development of supporting application software in an international environment. Duties will include using VAX/VMS, COBOL, BASIC, FMS, SQL, RDB, Datatrieve, DCL, Windows, and PCs to develop and direct application software testing procedures, programming, and documentation. Responsibilities will include using C, C++, Visual Basic, Access and Client/Server technology to design software systems for Finance and Business units. Will consult with customers concerning support of application software. May coordinate implementation of application software in various locations. Requirements are an MSEE or CS with 3 yrs. exp. in the job offered or equivalent BSEE or BCS with 5 yrs. of exp. as a Programmer Analyst. 40 hr. work week; 8:15 am to 5:00 pm M-F. Salary $59,449.00 per yr. Send resumes to Case #70820, PO. Box 8968, Boston, MA 02114. EOE. Applicants must be U.S. workers eligible to accept employment in the United States on a full-time basis.

SOFTWARE ENGINEER required. Design and development of three-tier client/server systems using Oracle 7 as RDBMS, DCE for distributed computing and Encina for transaction integrity. Integration using UNIX shell programming and Pro*C. Bachelors degree required in any computer related curriculum. Must have 3 years of experience in any occupation in the job duties described above. Must be willing to relocate to various unanticipated work sites throughout the USA every 4 to 10 months -necessary travel between assignments paid by Employer. Must have proof of legal authority to work in the U.S. Salary $50,000 per year. Monday thru Friday, 8am-5pm, 40 hour work week. Please report or submit resume to the Pennsylvania Job Center at: Mr. James Mackin, Manager, Office of Employment Security, 120 Merchant Street, Ambridge, Pennsylvania, 15003. Job Order No. 8025108. Ad paid by an Equal Opportunity Employer.

COMPUTERWORLD
FALL Campus Edition

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Advertising Deadline:
September 17, 1997

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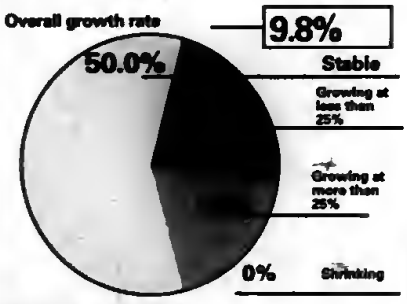
Career Survey: Insurance Software

Industry Hiring Trends

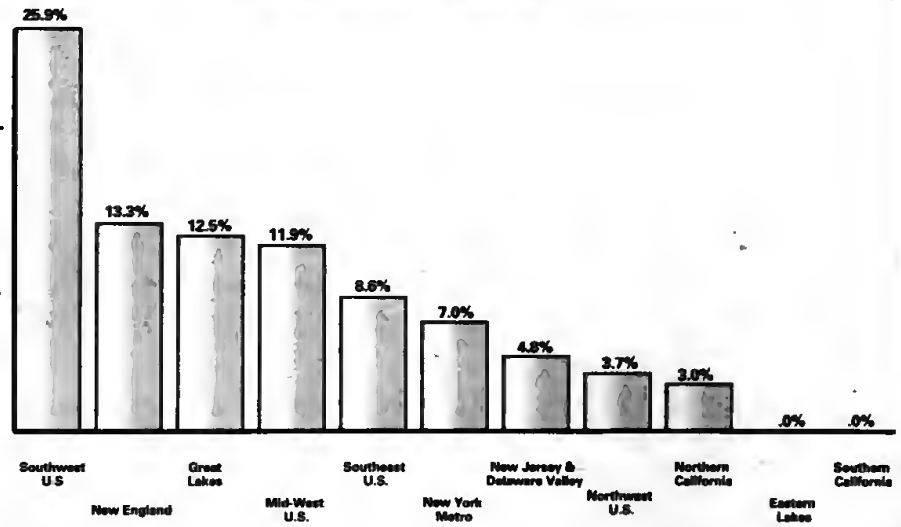


Survey Base: 50 Technology Firms Involved in Insurance Software

Survey conducted between March '97 and June '97

CogTech, a directory publisher in Woburn, Mass., tracks the U.S. 45,000 technology manufacturers. This survey relates to the 31,327 tracked firms with fewer than 1,000 employees.

Regional Growth Analysis



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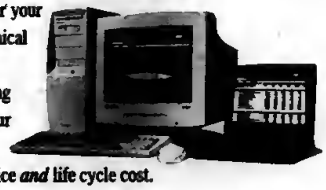

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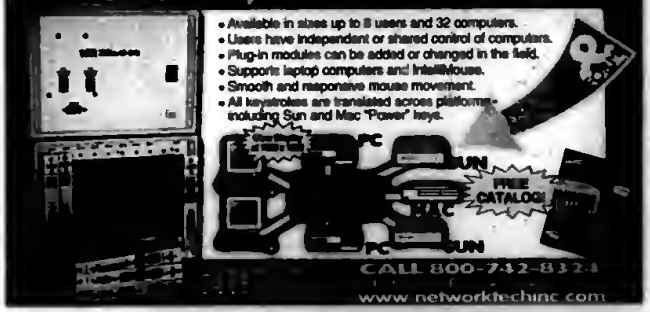
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The Week in Stocks

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INDUSTRY ALMANAC

Iomega Zips along

Investors should snatch up Iomega Corp. (NYSE:IOM) stock as fast as PC users are gobbling up the company's Zip and Jaz drives, financial analysts say.

Paced with no substantial competition, the Roy, Utah, storage maker has become the dominant force in the market, analysts say. Iomega has increased its sales by bundling its drives with those of the top PC makers.

"Jaz on the high end and Zip on the low end have been entrenched as sort of de facto standards," says Stan Corker, an analyst at Emerald Research in Lancaster, Pa. "It's become as popular as 'quick,' and the installed base is as strong now."

Iomega has shipped 7 million Zip drives in the past two years and three months, Corker says.

Analysts expect Iomega's stock to soar for the next 18 months, earning 25 cents per share in the third quarter, 32 cents per share in the fourth quarter and $1.32 per share by the end of the next fiscal year. When Iomega two weeks ago announced a second-quarter profit of $26 million — or 19 cents per share — its stock rose $4.19, to $24.56. Analysts expect the stock to rise to $28 by year's end.

Analysts say similar technology, the LS-120 SuperDisk manufactured by a division of Matsushita Electronics Corp. in Japan, is having a hard time making headway against Iomega. A recordable digital video disc drive, called DVD-RAM, may one day be a threat to Iomega. But by the time it is released in about two years, Iomega will most likely have cornered the market, analysts say.

"The DVD-RAM is too far out and too expensive to impact Zip, although in the very long term, it could have interesting possibilities," Corker says.

Howard Rosencrans, an analyst at HD Brous & Co. in Great Neck, N.Y., says DVD-RAM won't hurt Iomega. "Within two years, Iomega will have established the standard for computers. Two years from now is much too late," he says.

Iomega's strategy is to focus more sales to PC vendors. Sales directly to PC makers have increased 10% this year — from 30% of total sales in the first quarter to 40% of total sales in the second quarter, said Brian Goodstadt, an analyst at Standard & Poors Equity Research in New York. — Wylie Wong

SPLITTING STOCKS AT IOMEGA

Date	Split	Closing price
Nov. 1994	5 for 4	3⅞
Jan. 1996	3 for 1	44⅛
May 1996	2 for 1	82⅛

Exch	52-Week	Range	July 25 Last	Wk Net Change	Wk Pct Change
COMS	91.38	24.00	3 COM Corp	56.44	2.69	5.0
AIT	71.75	49.63	AMERITECH Corp	67.50	1.56	2.4
ANCI	68.25	38.13	Ascend Communications	49.63	-0.75	1.5
T	42.63	30.75	AT & T	35.75	1.25	3.6
BNYN	7.69	1.19	Bonyan Systems Inc	2.44	0.25	11.4
BAY	54.00	15.38	Bay Networks Inc (H)	51.44	3.44	12.3
BEL	78.25	53.13	Bell Atlantic Corp	71.50	2.38	3.4
BLS	69.69	55.25	BellSouth Corp	66.44	1.94	4.3
BRKT	42.25	9.25	Broadband Technologies	10.75	0.56	0.0
CS	46.50	26.50	Cabletron Systems	33.31	2.50	7.7
CGNH	17.50	8.63	Cambridge Communications	11.75	-0.75	-6.0
CSCO	80.94	46.75	Cisco Systems Inc (H)	79.63	2.75	3.6
CMNT	7.00	3.75	Computer Network Tech	3.69	-0.50	1.6
DIGI	53.11	13.63	DSC Communications	37.41	1.50	-5.3
FORE	93.63	18.00	FORE Systems Inc	14.41	0.59	6.2
GDC	12.50	6.13	General Datacomm Indst	7.38	-0.50	-6.3
GSX	53.38	36.13	Gerard Signal Networks	50.19	1.00	-2.7
GTE	49.38	35.75	GTE Corp	45.75	-0.63	1.3
LU	80.75	35.75	Lucent Tech	64.63	1.13	1.3
MADGF	16.13	4.50	Madge Networks NV	6.31	-0.56	6.2
MCIC	41.38	22.38	MCI Communications Corp	34.38	0.63	1.9
NETM	11.13	2.50	NetManage Inc	3.13	-0.13	3.8
NTRX	8.50	1.44	Netrix Corp	2.50	0.25	11.8
NCDI	16.25	3.00	Network Computing Devices	9.13	0.00	4.3
NWK	20.00	11.13	Network Equipment Tech	19.25	0.50	2.0
NETG	50.25	11.13	Network General	35.31	1.78	13.2
NN	54.00	40.50	Newbridge Networks Corp	51.50	1.25	2.5
NT	107.19	49.13	Northern Telecom Ltd.	103.81	0.94	0.9
NOVL	15.00	8.28	Novell Inc	9.00	0.22	3.3
NYN	59.88	42.63	Nynex Corp	54.50	2.19	4.2
OCTL	31.75	15.88	Octel Communications Corp	30.51	0.13	0.4
ORSI	24.25	9.75	Optical Data Systems Inc	11.50	-0.39	3.6
PCTL	39.75	8.25	Picturetel Corp	9.88	0.53	5.6
PTON	4.25	1.51	Proteon Inc	1.75	-0.19	-9.7
RACO	6.38	1.56	Racotek Inc (L)	1.56	-0.31	16.7
RETI	9.25	3.88	Retix	4.44	0.25	0.6
SBC	62.25	40.00	SBC Communications	58.50	1.00	3.3
SFA	23.50	15.00	Scientific Atlanta Inc	21.13	-0.88	-4.0
SHVA	63.50	8.25	Shiva Corp	10.00	-0.50	-0.3
FON	52.75	34.75	Sprint Corp	49.75	3.63	7.9
SMSC	15.25	9.25	Standard Microsystems Corp	12.00	0.81	7.2
USW	59.44	27.25	U S West Inc	37.00	-0.50	-0.3
XIRC	31.13	7.50	Xircom	12.56	0.19	1.3
RYLN	50.38	12.38	Xylan Corp	18.31	-0.19	1.9

Exch	52-Week	Range	July 25 Last	Wk Net Change	Wk Pct Change
AALR	15.50	6.88	Advanced Logic Research	10.50	3.50	33.0
AAPL	97.75	42.75	Apple Computer Inc	76.50	0.94	5.4
ASTA	6.38	1.94	AST Research Inc	5.25	0.19	3.7
CPQ	139.00	44.25	Compaq Computer Corp (H)	137.38	7.25	5.0
DELL	146.88	22.63	Dell Computer Corp (H)	144.50	14.00	8.5
GTW	45.88	18.15	Gateway 2000 Inc (H)	50.69	0.50	0.0
HWP	79.56	59.75	Hewlett Packard Co	65.63	0.75	1.2
MUEI	25.38	9.75	Micron International Inc	18.50	-0.56	3.0
NPNY	74.00	49.00	NEC America	71.00	-0.56	0.7
SGI	28.88	12.63	Silicon Graphics	25.25	7.56	42.8
SUNW	47.88	22.63	Sun Microsystems Inc	46.00	1.00	2.2

AAHS	14.00	8.13	Amsdahl Corp	10.00	0.00	0.0
DGN	51.25	9.13	Data General Corp	50.81	2.31	0.1
DEC	42.88	25.38	Digital Equipment Corp	42.25	4.63	12.3
IBM	107.00	44.63	IBM (H)	108.50	2.75	2.7
MICD	0.75	5.88	Meridian Data Inc	6.00	-0.00	1.5
NETF	4.38	0.88	NetFrame	0.97	0.00	3.3
PRCN	20.13	9.00	Procom Technology Inc	10.63	-0.44	-6.0
SQNT	17.63	10.75	Sequent Computer Sys (H)	17.13	1.25	0.6
TERM	5.88	1.88	Sequoia System Inc	3.75	0.13	4.3
SRA	56.75	16.63	Stratus Computer Inc	49.19	5.50	19.1
TDM	20.38	10.13	Tandem Computers Inc (H)	17.81	1.25	4.7
UIS	9.19	5.38	Unisys Corp (H)	8.94	0.44	5.1

ADBE	49.00	28.63	Adobe Systems Inc	50.25	1.50	2.7
AMSWA	8.75	5.75	American Software Inc	7.13	-0.25	5.4
APLX	46.00	9.97	Applix Inc	8.13	-0.75	10.9
ARSW	30.50	17.00	Arbor Software	42.88	5.88	15.9
ADSK	42.88	18.50	Autodesk Inc	37.00	1.25	5.1
BGSS	53.50	19.75	BGS Systems Inc	27.50	-2.25	7.8
BMCS	62.38	27.50	BMC Software Inc	58.00	-0.25	0.4
BOOL	27.50	14.13	Books and Babbage	26.25	5.88	12.3
BORL	9.13	6.75	Borland Int L Inc	7.31	0.63	9.3
BOBJY	27.50	7.13	Business Objects	7.50	-0.25	3.2
CAYN	6.25	2.06	Cayenne Software Inc	2.75	-0.50	2.3
CNTR	5.88	1.13	Centura Software	2.75	-0.25	0.0
CHKP	36.25	15.63	Checkpoint Software Technologies	27.75	0.13	0.5
COGNF	39.50	18.00	Cognos Inc	27.75	1.69	-3.7
CA	70.00	37.25	Computer Associates (H)	97.50	3.00	5.2
CVIN	10.38	3.13	Computervision Corp	7.00	-0.25	-0.5
CPWR	61.25	18.00	Compuware Corp (H)	58.63	3.25	5.8
CSRE	29.38	10.75	Consolidata Inc	11.25	-0.13	1.1
COSFF	10.75	5.06	Cosoft Corp	5.50	-0.13	2.2
DWTI	6.63	2.25	Datawatch Technologies Inc	3.56	-0.19	-5.3
FILE	56.50	9.50	Filenet Corp	15.75	0.25	1.6
FRTE	47.00	7.25	Fourth Technologies	11.00	0.00	0.0
FTPS	3.50	3.69	FTP Software Inc (L)	3.50	-0.19	-4.8
HUMCF	58.50	22.00	Humming Bird Comm Ltd (H)	36.25	-0.25	0.7
HYSW	28.75	13.50	Hyperion Software Corp (H)	26.56	1.19	4.4
IBIC	16.50	11.00	Information Resources	14.44	-0.50	-0.4
IFMX	39.13	8.56	Informix Corp	11.44	1.91	20.0
INGR	12.63	6.75	Intergraph Corp	8.19	-0.44	5.5
LEAF	4.75	0.81	Interleaf Inc	2.50	0.50	17.1
ISLI	24.63	6.25	Intersolv Inc	13.13	0.00	0.0
INSU	41.50	20.88	Intuit Inc	24.56	0.00	0.0
TLC	23.75	5.50	Learning Co (The)	10.56	1.94	22.5
LGWX	12.38	4.75	Logic Works	7.38	0.75	11.3
MAPS	15.00	7.00	Mapinfo Corp	12.00	0.75	0.2
MATH	7.63	2.19	MathSoft	5.63	0.19	5.5
MCAF	68.50	50.63	McAfee Associates	64.13	52.25	-10.0
MENT	14.50	6.50	Mentor Graphics	9.81	1.13	12.9
MFCY	38.38	10.50	Micro Focus	27.00	1.00	3.9
MGXI	15.75	4.00	Microgrape Inc	6.94	0.15	1.8
MSFT	150.75	54.75	Microsoft Corp	139.75	3.75	-2.6
ORCL	59.00	35.03	Oracle Corp	55.44	-0.56	1.9
PMTC	64.25	34.38	Parametric Technology	56.00	1.50	2.9
PARQ	5.50	0.88	Part Place Systems Inc	1.13	0.00	5.5
PSFT	66.38	38.50	Peoplesoft	50.25	4.25	4.8
PTEC	10.75	11.88	Phoenix Technologies	12.75	0.13	0.9
PSQL	15.75	6.25	Platinum Software	12.44	0.51	7.9
PLAT	17.88	9.38	Platinum Technology	14.94	0.00	0.4
PRGS	22.00	12.75	Progress Software Corp	16.25	0.13	0.8
RNBO	22.13	13.75	Rainbow Technologies Inc	18.50	0.75	4.1
BIDS	28.75	5.00	Bids Back Systems Inc	8.08	-0.03	-0.4
ROSS	9.75	1.75	Ross Systems Inc	4.51	0.50	15.0
SAPE	57.75	30.00	Sapient Corp	53.25	9.50	0.9
SCOC	8.63	3.13	SCO Inc	5.50	0.38	8.1

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SDTI	44.38	21.00	Security Dynamics Tech	40.25	1.75	4.2
SOTA	19.75	8.00	State of the Art	13.00	0.00	4.0
SSW	78.88	27.25	Sterling Software Inc	38.88	0.44	1.3
SDRC	29.13	16.75	Struct Dynamics Research (H)	27.50	0.63	2.3
SYBS	21.13	12.13	Sybase Inc	14.69	-0.19	1.8
SYNC	22.19	8.75	Symantec Corp	21.00	0.00	2.7
SNPS	50.50	29.75	Synopsys	31.56	1.50	5.2
SSAI	15.50	5.00	System Software Assoc	8.97	0.03	0.3
SYSF	56.00	7.00	Systemsoft Corp	15.00	9.25	91.7
TRUV	9.00	2.00	Truevision Corp	2.00	0.00	0.0
VIEW	17.50	2.38	ViewLogic Systems	10.81	-0.06	-0.6
VMIS	10.50	5.50	Vmark Software Inc	8.69	-0.13	1.4
WALK	16.25	9.50	Walker Interactive Systems	14.00	-0.00	-5.9
WALL	29.13	12.25	Wall Data Inc	17.00	-0.06	4.7
WANG	24.06	16.00	Wang Laboratories Inc	22.38	-0.19	-0.8

AMZN	50.00	15.75	Amazon Com	26.75	0.50	1.9
AOL	74.50	22.38	America On-Line	64.81	-0.06	0.1
ATHM	68.50	16.63	At Home Corp	20.25	-0.75	-3.9
BBN	29.38	15.75	BBN Corp.	28.81	0.00	0.0
CSRV	16.75	0.63	Computerserve Corp	11.88	0.25	2.0
EDFY	50.99	0.56	Edify Corp	50.50	0.88	-3.0
EGIT	27.88	5.00	Egghead Inc	17.56	0.88	0.4
SEEK	59.00	4.38	Infoseek Corp	0.35	0.63	19.1
LCOS	22.75	8.75	Lycos Inc.	17.25	2.63	20.0
NETC	24.25	7.00	Netcom On-Line	14.44	0.44	3.1
NSCP	80.00	23.50	Netscape Comm Corp.	96.00	-8.63	-10.3
OMKT	23.50	6.50	Open Market Inc	11.50	-0.50	-4.2
PSIX	14.50	5.50	PSINet	8.50	0.94	4.0
QDEK	9.88	2.00	Quadravision Corp.	2.75	0.12	4.6
RAPT	38.75	8.88	Raptor Systems	12.44	1.44	13.1
SCUG	39.25	4.75	Secure Computing Corp	6.31	-0.06	-1.0
SPYG	20.25	8.88	Spyglass Inc.	9.19	0.38	0.5
YHOO	51.88	15.56	Yahoo! Inc	47.00	-0.25	-0.2

AMD	48.50	18.25	Advanced Micro Devices	13.56	-2.81	7.3
ADI	31.88	12.75	Analog Devices Inc	21.25	-1.56	-4.0
CHPS	26.50	7.88	Chips and Technologies	13.19	-0.25	-1.9
CRUS	24.25	8.00	Cirrus Logic	12.75	-0.25	1.9
CY	16.00	8.13	Cypress Semiconductor Corp.	14.56	-0.25	-1.7
CYRS	56.00	31.50	Cyrix	31.13	7.15	-5.3
INTC	80.75	63.00	Intel Corp (H)	90.00	5.00	2.6
LSCC	48.44	21.50	Lattice Semiconductor	44.15	0.63	1.0
LSI	50.00	17.00	LSI Logic Corp	31.63	-0.69	2.1
MCRL	84.75	42.75	Micrel Semiconductor Inc	64.75	10.00	18.3
MU	88.50	30.69	Micron Technology	45.19	-7.06	-2.3
MOT	90.50	44.50	Motorola Inc	79.56	-6.25	-7.3
NSM	57.00	15.50	National Semiconductor	38.50	-1.81	-5.2
TXN	119.50	60.63	Texas Instruments	106.00	3.55	5.0
VLSI	30.75	20.50	VLSI Technology	28.75	0.55	1.9
XLNX	36.38	20.25	Xilinx	27.63	0.19	0.6
ZLC	20.00	10.88	Zilog Inc	14.19	1.56	6.9

ADPT	48.88	17.50	Adaptec Inc	42.00	1.13	2.7
APCC	11.00	8.88	American Power Conversion	25.00	2.00	8.7
CBCHC	5.00	0.97	Cabletel Corp	1.00	-0.16	-12.5
CREAF	20.13	8.00	Creative Technology Ltd (H)	25.50	1.88	8.2
RACE	24.25	5.00	Data Race Inc	10.06	-0.31	-3.0
DTM	12.50	5.88	Datatape Corp.	9.75	-0.69	-6.6
EMC	51.00	18.88	EMC Corp. (H)	40.00	1.06	2.7
EMLX	21.25	12.88	Emulex Corp.	14.69	-0.19	-1.8
ESCC	29.75	19.75	Exabyte Corporation	27.25	-1.25	-4.4
EXBT	17.50	6.00	Exabyte	11.75	-0.75	-6.0
HSLF	2.63	1.25	Information Stor. Systems	1.50	0.06	0.0
IOMG	27.00	12.63	Iomega Corp.	22.00	-2.56	50.4
IPLS	2.88	0.94	IPL Systems Inc.	1.25	0.00	4.8
KMAG	36.75	15.13	Komag Inc	18.06	-0.69	-3.7
MTSI	20.75	12.88	Micro Touch Systems Inc	20.50	1.50	5.9
MTIC	6.00	1.88	MTI Technology Corp (H)	6.00	1.88	21.5
PNCL	0.75	0.59	Pinnacle Micro Inc	5.75	0.44	63.6
AQM	0.38	2.38	QMS Inc	3.19	0.38	13.4
QNTM	29.44	5.88	Quantum Corp (H)	28.75	2.44	9.3
RDUS	2.38	0.19	Radius Inc	0.34	0.06	0.0
SEG	56.25	18.75	Seagate Technology	40.81	1.50	3.9
SDS	19.63	9.75	Storage Computer Corp.	11.50	-0.38	-3.2
STK	54.38	30.00	Storage Technology	49.50	-2.94	-3.8
TEX	89.25	38.88	Tandon Inc	63.50	-0.44	-0.3
WDC	44.00	30.88	Western Digital Corp	38.69	0.25	0.0
XBN	54.00	44.00	Xebec Corp	48.06	-0.75	-1.0

AMSY	32.13	15.75	American Mgmt Systems	26.44	0.81	3.2
ANLY	39.50	17.38	Analytics Int L	20.50	1.75	4.8
AUD	80.44	27.50	Auto Data Processing (H)	68.75	0.31	0.8
BDAM	80.75	19.75	BDM International Inc	24.88	2.25	9.6
CATP	48.50	21.25	Cambridge Tech Partners (H)	36.51	0.51	0.0
CEN	53.13	29.50	Ceridian Corp.	42.00	2.25	9.7
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EGGS	9.88	3.50	Egghead Discount Software	4.81	0.13	2.7
EDS	69.50	31.75	Electronic Data Systems Corp.	64.81	-0.56	-1.2
INAC	40.64	19.75	Inacom Corp.	33.88	-0.38	-1.1
INEL	10.75	2.88	Intelligent Electronics	2.75	0.06	0.3
IEA	80.00	57.13	Ibama Inc.	69.94	-2.94	-4.2
MICA	25.00	12.50	Micronet Inc	23.88	5.13	5.3
PAYX	53.50	28.88	Paychex	39.63	-0.38	-1.2
PMS	54.00	33.75	Policy Management Sys.	50.75	0.38	5.3
REY	50.63	15.75	Reynolds and Reynolds	18.88	3.19	8.7
SCBI	27.00	19.00	SCB Computer Tech. Inc.	24.50	0.00	0.0
SEIC	29.75	17.75	SEI Corp (H)	29.44	-2.56	0.0
SMED	61.75	36.75	Shared Medical Systems	58.88	0.50	6.3
SSPE	55.50	19.00	Software Spectrum Inc	15.25	0.00	0.0
SDS	54.25	37.00	Sungard Data Systems (H)	50.00	4.50	-3.7
VSI	29.75	8.50	VanSingel Corp.	15.88	-0.38	-4.3

KEY: (H) = New annual high reached in period (L) = New annual low reached in period

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AT&T: A company on the wire

Lack of vision disconnects telecom giant

By Matt Hamblen

A RECENT television ad depicts an aging factory with letters on the roof that say "We're Number 1." But the "1" slowly begins to creak and fall, knocking down nearby letters so the message reads, "We're Numb."

An apt metaphor for AT&T Corp., said some analysts and customers of the $52 billion long-distance and telecommunications giant following the resignation of the president and other jolting developments at the Basking Ridge, N.J.-based company.

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Walter's departure came three weeks after merger talks between AT&T and regional Bell operating company SBC Communications, Inc. fell through. The falling out left AT&T on its own in the bid for local telephone service market share. It didn't help that the 8th Circuit Court of Appeals ruled July 18 against Federal Communications Commission enforcement of uniform local competition, forcing large companies to adhere to a variety of state laws.

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A spokeswoman defended the company's strategy. She said it was articulated by CEO Robert E. Allen and Walter when they addressed financial analysts in March.

"Our stated strategy is to be an any-distance company," said the spokeswoman, Ruthlin Newell. "Customers want local service and long distance and wireless or mobility that includes Internet access, and that includes access to entertainment. It's what our customers have told us they would like from a single company."

After the departure of John Walter (pictured) as president, here's what some think AT&T needs:

- A younger CEO with technology vision
- Regulations for uniform national local telephone service
- A local service business partner
- A focus on fewer technology areas

Petta said he has worked with AT&T for two decades, but he added that he has noticed a marked decline in the experience and quality of its technicians who are called to fix network problems. "Service used to be a differentiator for AT&T, but not any longer," Petta said. "It takes a two- to threefold increase in time to fix a problem" compared with the AT&T of old.

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American Eagle adds network computers to flight plan

CONTINUED FROM COVER 1

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COMMENTARY

HTML? How about Word instead?

David Coursey

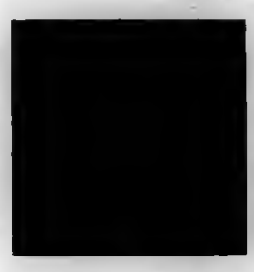
Is HTML all washed up? With Microsoft and Netscape still heading in different directions with their "dynamic HTML," and with page-building tools forcing tables to perform ever more unnatural acts to build WYSIWYG pages, the answer seems to be yes.

This is happening not a moment too soon, because HTML isn't the liberating technology it once was. It's now a shackle on creative content development. We need something else, and as is so often the case, it already exists.

My modest proposal is to use Microsoft Word's .doc format as the document language of the Internet.

Yes, *that* Microsoft Word. Instead of shipping HTML pages around, we'd ship Word documents — perhaps streaming Word documents — around the Internet. Instead of Navigator or Explorer, we'd open those Internet .doc files just as we've always done — with Word or the free viewer that Microsoft already provides.

Besides being easy for users, standardizing on .doc files would help solve the problem of Microsoft messing with the file format as often as it does, breaking something users weren't trying to have fixed, making it hard for different versions of Word to share documents.



For corporate record keepers, standardizing on Word files solves the problem of how to convert everything to HTML just to support browsing by people who probably have something better to do anyway.

With a Word file, all you have to do is glide over to the server and click on it. Voila! The document opens on your desktop just like an HTML page.

Sure, the Word pages open more slowly, but you can get a pretty rich document in return.

And yes, we need a file system that makes it easier to find things. But isn't Internet Explorer 4.0 — Microsoft's "We co-opt the Internet as our own" release — supposed to fix that? Sure, it uses HTML pages to explain the content of directories, but creation of those indexes ought to be easy enough to automate.

AND ANOTHER THING

Something else I'd like is for a summary or headline to appear whenever I slide my cursor over a file name. That would allow me to figure out easily if I was interested in something before I opened it. And once I do open something, streaming content would allow the user to read Page One while Page 30 was still being loaded.

One area in which I will admit my idea runs into trouble — besides being just a bit out in left field — is cross-platform portability. Word, the last time I checked, was a creature of Windows and Mac OS. And not, say, of Sun Solaris. But that's OK, because it seems as if everyone at Sun has a Windows machine sitting on his desk keeping the Unix terminal or network computer company.

Normal mortals would get a converter that automatically translates .doc files into whatever they could use.

I concede that this idea probably doesn't make as much sense for the mass-media Internet as it does for the corporate intranet. If you can afford a huge staff of designers and programmers to gussy up your pages, that's great. You can use anything your users can decode — such as Java or ActiveX — to build your site.

But the rest of us need something aimed more at creating rich documents. If there is a product better suited to this task than Word, millions of users need to find it. It certainly isn't HTML, dynamic or otherwise. □

Coursey, an analyst and consultant, is editor of "coursey.com," an online newsletter available at www.coursey.com. His E-mail address is david@coursey.com.

Come, step into . . . the IS Zone

Frank Hayes

Indulge us, won't you? Tonight, we humbly request that you give up your comfortable reality. For a few minutes, journey to two different dimensions, slightly skewed from the day-to-day world we all know.

We'll lead you through two parallel universes in which the most bizarre occurrences are commonplace. One is the IS Zone, where ordinary people find themselves hopelessly trapped like rats in a laboratory maze, with no right answers and no way out.

The other is the User Zone, a happy land without responsibilities or consequences, where nothing changes, nothing makes sense — and nothing will ever be right.

And yet somehow, these zones coexist every day.

Submitted for your approval:

In the IS Zone, you order lunch in a restaurant. When it arrives, the coffee is cold. You complain to the waitress. She writes you a trouble ticket and tells you someone will get back to you by the end of the day.

In the User Zone, customers never actually get to eat; every time the waiter brings food, they ask for something different.

In the IS Zone, you drop off your car at Zippy Lube for a one-hour oil change. An hour later, the car isn't done. Three hours later, it still isn't done. Around midnight, the mechanics tell you they've drained your old oil, but they don't know how to refill the crankcase — and don't plan to learn.

In the User Zone, no one ever changes their oil. If the car makes unpleasant noises, it's the dealer's fault. If the car stops running, there must have been something wrong with that last tank of gas. If the car catches fire, blame the insurance agent.

In the IS Zone, your morning newspaper doesn't arrive. When you call the newspaper office, the staff insists the paper was delivered. You point out that your neighbor didn't receive a paper either. The paper says no one else has complained. You later learn that the newspaper didn't publish that day.

In the User Zone, people expect newspapers to be free, accurate and literate — and to give you tomorrow's news today. And the pictures to move, just like on TV.

In the IS Zone, you pay a neighborhood kid $10 to cut your grass. He takes his lawn mower apart on your front porch, replaces the spark plug and oils the wheels. The mower still doesn't work, so he goes home.

In the User Zone, everyone waits until the grass is waist-high before mowing it — and then complains that the lawn doesn't look like a putting green.

In the IS Zone, you rent a tuxedo for your brother's wedding. When you arrive to pick it up, you discover that it's lime green instead of black, the sleeves are 6 inches too long and the pants are transparent. But the salesman assures you the suit will last for years.

In the User Zone, no one cares what they wear — as long as it's at least as new and expensive as what the people down the hall have.

In the IS Zone, you arrive at the emergency room with blood gushing from a gash in your head. The doctor on duty insists on updating all your vaccinations before applying a tourniquet to your neck.

In the User Zone, the emergency room is stocked with nothing but bicarbonate of soda. Heck, it works so well on an upset stomach, it should be perfect for a broken leg or a ruptured appendix, too.

In the IS Zone, you come home from work to discover that someone has rearranged all the furniture in your house, reset the clocks, replaced your clothes and changed your will.

In the User Zone, everyone has lived in the same house, worn the same clothes, eaten the same breakfast and worked at the same job for 40 years.

And complained about it the whole time. □

Hayes is Computerworld's staff columnist. His Internet address is frank_hayes@cw.com.

The Back Page

alt.cw

Dispatches & images from the fringes of the electronic frontier

INVASION OF THE ROBOTS

The Mars Pathfinder mission has sparked robot mania, including the re-release of the "Robby the Robot" and "Machina Man" wind-up toy robots from the 1950s and '60s (*www.rocketusa.com*). Meanwhile, sales of industrial robots are surging, according to the Robotic Industries Association in Ann Arbor, Mich. U.S. robot makers reported a record-setting $1 billion in new orders last year and rapid growth in the first quarter of this year.

Computerworld INDEX

Top speed of the computer on NASA's Pathfinder spacecraft. **20 MHz**

Asking price for the domain name "christmas-shopping.com". **$50,000**

Number of states that use fingerprint scans for welfare applicants: **11**

Number of used PCs purchased last year. **2.4M**

Number of federal agency Web sites **4,300**

Percentage of Americans who say technology has made life better than 50 years ago **41%**

Percentage who say technology has made life worse **21%**

Percentage who say new technology is "exciting" **26%**

Percentage who say technology "scares me" **7%**

Sources: San Francisco Chronicle; Internet Gold Rush (www.goldrush.com); Privacy Times newsletter; Washington Computer Intelligence, La Jolla, Calif.; U.S. General Accounting Office, Washington; Popes Search Worldwide, New York

When Jolt isn't enough

Programmer Craig Brown left Lotus six years ago to create his own financial software package. Alas, holding a day job and coding his new product at night meant staying up until 6 a.m. every day for four years. He sucked down a lot of coffee and Jolt cola, but soon our hero invented a better-tasting caffeine delivery system: a mixture of saltwater taffy, Starbucks espresso beans and caffeine. The result is Tasty Buzz Taffy ($8.95, plus shipping) in the neon yellow taffy box (*www.floater.com/strength*). The irony is that Brown says he's made more money from the high-buzz taffy than from the software. He is president of Floater Corp. in Norwood, Mass.

Inside Lines

Where's Enzo?

Microsoft unwittingly invented a new game involving Windows NT group product manager Enzo Schiano during last week's Windows Platform demonstrations. Executives Jim Allchin and Steve Guggenheimer were demonstrating how the Windows NT 5.0 Active Directory could complete almost instantaneous searches, even if you don't know how to spell the name of the person you're searching for. Imagine their surprise when they tried and failed three times to locate Schiano. Allchin quickly blamed it on "a hardware error, not a problem with NT 5.0."

Getting the bugs out

Speaking of Microsoft and bugs, the company is logging 25,000 calls per day from beta users who are reporting glitches in the upcoming Windows 98 operating system, Microsoft Group Vice President Paul Maritz disclosed. So far, none of the bugs seems serious, and there don't seem to be any particular glitches plaguing most users. "There's no specific bug that's affecting 30% or 40% of the users. So far, they seem to be random and unconnected. The most we've seen is a bug that affects 1.5% of the beta testers," Maritz said.

Waiter, there's a bug in my system

Microsoft product manager Charles Fitzgerald must have been caught up in the moment during a debate over Java with a Sun spokesman at Internet World/Summer '97 in Chicago last week. Referring to its Java Virtual Machine and boasting of its move onto other platforms, Fitzgerald said, "When we're talking about bug-for-bug compatibility, we'll bring the same bugs to every platform." Well, at least that's cleared up.

Talk about selective memory

During his tongue-lashing of Sun, Fitzgerald sarcastically noted that Java doesn't work with Microsoft's Windows 3.1 platform, so millions of 3.1 users are being left out. He conveniently neglected to mention that Microsoft's ActiveX doesn't run on Windows 3.1 and neither does the latest version of Visual Basic.

Stop me before I kill again

Erstwhile Informix CEO Phil White seemed to be declaring a truce in his sniping war with Oracle czar Larry Ellison during a press conference last week. White said Informix's infamous anti-Oracle billboard along Highway 101 in Redwood Shores, Calif., probably will start being put to less confrontational marketing uses. "I think Ellison and I have done enough chaffing each other around," he said. Alas, the truce was broken just minutes later when White chided Ellison for going from obsession to obsession, with his latest being "the size of Bill Gates' house."

Children of the '60s

Mainframers are starting to feel their oats as organizations tie more and more client/server systems back to the reliable processing and security of newer mainframes. For example, seen on a mainframe Internet discussion list recently was this sentiment: "There are two major products to come out of Berkeley: LSD and Unix. We don't believe this to be a coincidence."

Maintenance management software maker PSDI last week hit an all-time low when it marketed its product by invoking the tragedy of TWA Flight 800. In an invitation to its user group conference this week, the Cambridge, Mass.-based software firm touted its better-than-expected earnings announced July 17, then segued into, "sadly, that date also heralded the anniversary" of the flight's midair explosion.

But PSDI didn't stop there. The company then implied that better maintenance management (possibly PSDI's product) may have prevented the disaster. If you have some tasteful news tips, send them to news editor Patricia Keefe at (508) 820-8183 or patricia_keefe@cw.com.

The Back Page

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Dispatches & Images from the fringes of the electronic frontier

INVASION OF THE ROBOTS

The Mars Pathfinder mission has sparked robot mania, including the re-release of the "Robby the Robot" and "Machine Man" wind-up toy robots from the 1950s and '60s (*www.rocketusa.com*). Meanwhile, sales of industrial robots are surging, according to the Robotic Industries Association in Ann Arbor, Mich. U.S. robot makers reported a record-setting $1 billion in new orders last year and rapid growth in the first quarter of this year.

Computerworld INDEX

Top speed of the computer on **NASA's Pathfinder** spacecraft: **20 MHz**

Asking price for the **domain name** "christmas-shopping.com": **$50,000**

Number of **states** that use **fingerprint scans** for welfare applicants: **11**

Number of **used PCs purchased** last year: **2.4M**

Number of **federal agency Web sites**: **4,300**

Percentage of Americans who say **technology** has made **life better** than 50 years ago: **41%**

Percentage who say **technology** has made **life worse**: **21%**

Percentage who say **new technology** is "**exciting**": **26%**

Percentage who say **technology** "**scares me**": **7%**

Sources: *San Francisco Chronicle*; Internet Gold-Rush (www.goldrush.com); "Privacy Times" newsletter, Washington; Computer Intelligence, La Jolla, Calif.; U.S. General Accounting Office, Washington; Roper Starch Worldwide, New York

When Jolt isn't enough

Programmer Craig Brown left Lotus six years ago to create his own financial software package. Alas, holding a day job and coding his new product at night meant staying up until 6 a.m. every day for four years. He sucked down a lot of coffee and Jolt cola, but soon our hero invented a better-tasting caffeine delivery system: a mixture of saltwater taffy, Starbucks espresso beans and caffeine. The result is Tasty Buzz Taffy ($8.95, plus shipping) in the neon yellow taffy box (*www.floater.com/strength*). The irony is that Brown says he's made more money from the high-buzz taffy than from the software. He is president of Floater Corp. in Norwood, Mass.

Inside Lines

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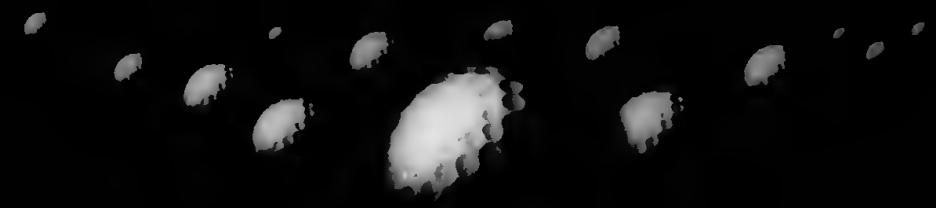

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